

Smart City Challenge Finalists Project Proposals

City	State	Challenge	Vision Element
Austin	TX	Lack of Travel Options	User-Focused Mobility Services and Choices
Pittsburgh	PA	Interoperability, Privacy, and Security	Low Cost, Efficient, Secure, and Resilient ICT
Portland	OR	Complexity of Planning / Completing a Trip	User-Focused Mobility Services and Choices
Kansas City	MO	Lack of Traveler Information	Connected, Involved Citizens
Pittsburgh	PA	N/A	Strategic Business Models and Partnering Opportunities
Kansas City	MO	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Kansas City	MO	Response Times for First Responders	Intelligent, Sensor-based Infrastructure
Kansas City	MO	Delays on Freeways	Connected Vehicles
Pittsburgh	PA	Accessibility for People with Disabilities and the Elderly	User-Focused Mobility Services and Choices
Denver	CO	Complexity of Planning / Completing a Trip	User-Focused Mobility Services and Choices

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Strategy	Description	Safety	Mobility	Environment	Opportunity
Microtransit Service	Bridj		✓		
Approach to Data Security and Privacy	Approach to Data Security and Privacy				
Multimodal Trip Planning	Multimodal Trip Planning		✓	✓	✓
City Services (from Kiosks)	Kiosks will provide information on city services, current events, transportation services, local business information, public digital art, local history, and entertainment.				✓
Partnership with Sidewalk Labs	Partnership with Sidewalk Labs		✓		
Emissions and Air Quality Analytics	Gauging air quality across the open spaces, key transit corridors, and surrounding areas. Measuring health and activity levels of residents and workers using a custom-designed, opt-in mobile app.			✓	
Gunshot Detectors	Gunshot Detection - integrated with 911 and Police.	✓			
Ramp Metering	Ramp Metering		✓	✓	
Apps for People with Disabilities	Bluetooth beacons allow registered profiles with types of limitations via smartphone app				
Mobility Marketplace	The Mobility on Demand Enterprise (MODE) will allow the City to consolidate all mobility service options into one cohesive application service framework. New TSPs, carbon emissions		✓	✓	✓

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Crosscutting



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Denver	CO	Lack of Traveler Information	User-Focused Mobility Services and Choices
Austin	TX	Lack of Traveler Information	User-Focused Mobility Services and Choices
Austin	TX	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Kansas City	MO	Digital Barriers	Connected, Involved Citizens
Pittsburgh	PA	N/A	Low Cost, Efficient, Secure, and Resilient ICT
Austin	TX	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Kansas City	MO	Lack of Travel Options	Smart Land Use
Columbus	OH	Lack of Travel Options	Smart Grid, Roadway Electrification, and EVs
Pittsburgh	PA	Pedestrian / Bicyclist Safety	Intelligent, Sensor-based Infrastructure
Columbus	OH	Vehicle / Vehicle Collisions (non-intersections)	Connected Vehicles
San Francisco	CA	N/A	Strategic Business Models and Partnering Opportunities
Columbus	OH	N/A	Strategic Business Models and Partnering Opportunities
San Francisco	CA	Lack of Available Parking and/or Parking Information	Intelligent, Sensor-based Infrastructure

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	estimators and transportation spending reports will be included in a new, fully integrated payment platform.			
Transit Information	Transit Information	✓	✓	✓
Phone Call-in for Traveler Services	Call-in services will provide underserved options	✓		✓
Environmental Sensors	Environmental sensors / road weather information systems (RWIS).		✓	
Training for Transportation Options and Technology	Training of technology and mobility options.	✓		✓
Existing Fiber	Existing Fiber			
Crash Analytics	Incident management programs will monitor near misses as well as crashes in order to take the necessary actions	✓		
Coordination with Real Estate Developers for Shared Transportation	Partnership with Real Estate Developers to encourage adoption of shared transportation	✓	✓	
Electric Vehicle Carshare	EV Carshare with Car2Go	✓	✓	
Pedestrian Detectors (intersections)	Pedestrian detection integrated with smart street lights	✓		
Emergency Electronic Brake Light Warning	Emergency Electronic Brake Light Warning	✓		
Partnership with Public Agency	Partnership with Public Agency			
Partnership with non-Profit	Columbus Partnership			
Real-Time Parking Data	Parking information	✓	✓	






















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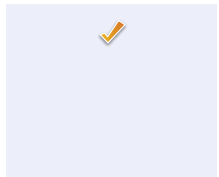
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Columbus	OH	Response Times for First Responders	Connected Vehicles
Portland	OR	Freight Delays / Congestion	Connected Vehicles
Austin	TX	Understanding Citizen Needs / Issues	Urban Delivery and Logistics
San Francisco	CA	N/A	Strategic Business Models and Partnering Opportunities
Portland	OR	Interoperability, Privacy, and Security	Architecture and Standards
Kansas City	MO	Transit Collissions with Vehicles / Pedestrians	Connected Vehicles
Kansas City	MO	N/A	Connected Vehicles
Portland	OR	Unpredictable / Unreliable Transit Service	Connected Vehicles
Kansas City	MO	Response Times for First Responders	Connected Vehicles
Austin	TX	Workforce Training / Development	Connected, Involved Citizens
Kansas City	MO	Lack of Available Parking and/or Parking Information	User-Focused Mobility Services and Choices
San Francisco	CA	Freight Delays / Congestion	Urban Delivery and Logistics

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Emergency Vehicle Preemption	Emergency Vehicle Preemption			
CV Trucks	FedEx vehicles			
Customer Engagement for Urban Delivery	Information on urban delivery options in our outreach efforts with the Smart ambassadors program.			
Partnership with NXP	Partnership with NXP			
Standards and Architecture	The city will utilize existing standards for deployment and integration of new technologies. Portland plans to follow USDOT architecture and standards.			
Mobileye Technology	Mobileye technology on buses (300)			
CV Taxis	Taxis equipped with CV technology.			
CV Buses	TriMet vehicles			
CV Police Vehicles	75 police vehicles			
Training and Programs to Link People to Jobs	Partnership with Community College; The college is redeveloping the defunct Highland Mall on Airport Boulevard — a corridor that has already been studied for transportation improvements — into an innovative learning campus that will likewise feature a mix of uses and services.			
Parking Management and Information	Parking Information available thru Cisco Digital Platform (CDP).			
Freight Signal Priority	Freight Signal Priority			

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Denver	CO	N/A	Strategic Business Models and Partnering Opportunities
Denver	CO	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Pittsburgh	PA	N/A	Smart Land Use
Columbus	OH	Data Storage and Management	Urban Analytics
Portland	OR	Freight Delays / Congestion	Urban Automation
Austin	TX	Pedestrian / Bicyclist Safety	Intelligent, Sensor-based Infrastructure
Austin	TX	Workforce Training / Development	Connected, Involved Citizens
Austin	TX	Limited Tools to Support Data Driven Decision Making	Urban Analytics
San Francisco	CA	N/A	Strategic Business Models and Partnering Opportunities
Kansas City	MO	Poor Air Quality / Harmful Vehicle Emissions	Smart Land Use
Austin	TX	Understanding Citizen Needs / Issues	Connected, Involved Citizens
Columbus	OH	Speed-related Crashes	Connected Vehicles
Austin	TX	N/A	Urban Automation
Columbus	OH	N/A	Connected, Involved Citizens

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Partnership with OEM	Partnership with GM Maven; CAMP			
Traffic Data	Traffic/sensor data (including CCTV and new Cobalt Sky traffic controllers)	✓		
Smart Growth Initiatives	Planning for TOD	✓	✓	
AWS Cloud Hosting	Leverage AWS Cloud			
AV Truck Demonstration	Daimler/Freightliner plans to demonstrate the autonomous Inspiration Truck in mixed-use corridor traffic.	✓	✓	
Pedestrian Detectors (intersections)	Bike and pedestrian detectors at intersection at signalized intersections	✓		
Smart City, Smart Student Travel Information and Training Program	Smart City, Smart Student Travel Information and Training Program			✓
Developer Platform (APIs and SDKs)	APIs			
Smart City Forum / Institute	Smart City Institute			
Emissions Reduction Plan	Emissions Reduction Plan		✓	
Community Outreach / Engagement	A wide-reaching outreach campaign both online and in communities to educate and solicit feedback. . Outreach to community to better understand traveler needs; Smart Trips Program			✓
Speed Warnings at School Zones	Speed Warnings at School Zones	✓		
AV Testing Facility	Closed Loop Test Facility at the Airport	✓		
Transit Benefit Program	Transit Outreach and Education to Businesses		✓	✓

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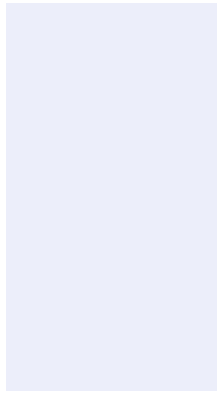
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Pittsburgh	PA	Poor Lighting	Intelligent, Sensor-based Infrastructure
Kansas City	MO	Complexity of Planning / Completing a Trip	User-Focused Mobility Services and Choices
Pittsburgh	PA	Lack of Traveler Information	User-Focused Mobility Services and Choices
Portland	OR	Transit Collisions with Vehicles / Pedestrians	Connected Vehicles
Columbus	OH	Language Barriers	User-Focused Mobility Services and Choices
Portland	OR	Limited Tools to Support Data Driven Decision Making	Urban Analytics
San Francisco	CA	N/A	Strategic Business Models and Partnering Opportunities
Denver	CO	N/A	Strategic Business Models and Partnering Opportunities
Kansas City	MO	Red Light Violations	Connected Vehicles
Denver	CO	N/A	Smart Land Use
Columbus	OH	Understanding Citizen Needs / Issues	Connected, Involved Citizens

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Smart Street Lights	Upgrading streetlights to LED technology and installing wireless sensor devices on 2,840 street lights	✓		✓	
Multimodal Hubs / Stations	Mobility hubs will better accommodate travelers transferring to other transportation services providing for convenient transfers.		✓		✓
Traffic Information	MovePGH will provide residents and visitors with the ability to view comparable options across multiple modes such as public transportation, taxi, bikeshare, carshare, biking, walking, and driving and parking. Users will be able to compare travel options over categories such as real-time travel time, carbon emissions, construction detours, safety, and condition of travel paths (i.e., sidewalk presence or condition).		✓		
Vehicle Turning Right in Front of Transit Vehicle	Vehicle Turning Right in Front of Transit Vehicle	✓			
Multilingual Applications	Multilingual Applications				✓
Performance Measure Dashboard	Performance Measure Dashboard	✓	✓	✓	✓
Partnership with DOE	Partnership with DOE			✓	
Partnership with NXP	NXP to equip 300 vehicles	✓	✓	✓	
Red Light Warning Violation	Red Light Warning Violation	✓			
Smart Growth Initiatives	Smart Growth Initiatives		✓	✓	
Smart Ambassadors	Up to 25 early adopters in each district will serve				✓

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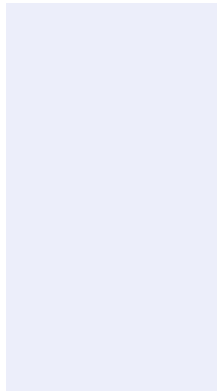
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Pittsburgh	PA	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Austin	TX	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs
Austin	TX	Unpredictable / Unreliable Transit Service	Connected Vehicles
Columbus	OH	Lack of Traveler Information	User-Focused Mobility Services and Choices
Kansas City	MO	Accessibility for People with Disabilities and the Elderly	User-Focused Mobility Services and Choices
Kansas City	MO	Workforce Training / Development	Connected, Involved Citizens
Kansas City	MO	Interoperability, Privacy, and Security	Low Cost, Efficient, Secure, and Resilient ICT
Austin	TX	Poor Air Quality / Harmful Vehicle Emissions	Urban Delivery and Logistics
Kansas City	MO	Lack of Travel Options	User-Focused Mobility Services and Choices
Austin	TX	Freight Delays / Congestion	Urban Delivery and Logistics

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	as Smart Columbus ambassadors to share experiences and help neighbors learn how to use the system.				
Congestion and Traffic Analytics	Congestion and Traffic Analytics along Smart Spines.				
EV Incentives with Auto Dealers	Direct engagement/incentives with auto dealers for EVs.				
CV Buses	100 buses				
Transit Options	Transit Options				
Paratransit	Paratransit at Multimodal Hubs				
Training and Programs to Link People to Jobs	Training to Link People to Jobs				
SCMS	Security Management System				
Rewards for Safe and Eco-Driving	Consumer Connected Vehicle Program – Aims to quickly connecting consumer vehicles for the primary purpose of promoting safe, environmentally friendly driving behaviors. With this program, vehicle owners transmit data regarding their vehicle's operation and are subsequently scored and could earn rewards (e.g. merchandise, parking perks, etc.) on the basis of their driving habits.				
Microtransit Service	Bridj				
Freight Signal Priority	Freight Signal Priority				

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San Francisco	CA	Understanding Citizen Needs / Issues	Connected, Involved Citizens
San Francisco	CA	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Columbus	OH	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs
San Francisco	CA	N/A	Strategic Business Models and Partnering Opportunities
Denver	CO	Digital Barriers	Connected, Involved Citizens
San Francisco	CA	Lack of Travel Options	User-Focused Mobility Services and Choices
Austin	TX	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
San Francisco	CA	Poor Air Quality / Harmful Vehicle Emissions	Smart Grid, Roadway Electrification, and EVs
Portland	OR	Delays at Intersections	Connected Vehicles
Austin	TX	Lack of Available Parking and/or Parking Information	User-Focused Mobility Services and Choices
Kansas City	MO	Freight Delays / Congestion	Connected Vehicles
Austin	TX	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Kansas City	MO	N/A	Strategic Business Models and Partnering Opportunities
Portland	OR	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs
Pittsburgh	PA	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Kansas City	MO	N/A	Strategic Business Models and Partnering Opportunities
Kansas City	MO	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs

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Smart Ambassadors	Smart Ambassadors				
Transportation Planning Analytics	Plan to use micro, meso, macro modeling to assess data and impacts on the system.	✓	✓	✓	✓
Tax Exemptions for EV Purchase	Tax Exemptions for EV Purchases			✓	
Partnership with Amazon Web Services	Partnership with Amazon Web Services				
Instructional Videos	Instructional Videos				✓
TNCs	TNCs		✓	✓	
Transit Data	Transit Data		✓		
EV Working Group	EV Working Group			✓	
MMITSS / I-Sig	Intelligent Traffic Signal System (ISIG)		✓		
Parking Management and Information	Parking Information		✓	✓	
Freight Signal Priority	Freight Signal Priority		✓	✓	
Urban Analytics Research Platform	Urban Analytics Research Platform	✓	✓	✓	
Partnership with Private Consulting Firm	Partnership with Private Consulting Firm				
EV Ride and Drive Events	EV Ride and Drive Events; Evs and e-Bikes			✓	
Developer Platform (APIs and SDKs)	APIs				
Partnership with Microtransit	Partnership with Microtransit		✓		✓
Parking Codes to Accommodate EVs	Priority parking for EVs at Airport.			✓	

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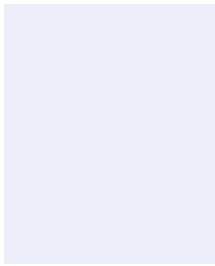
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Austin	TX	Lack of Travel Options	User-Focused Mobility Services and Choices
Denver	CO	N/A	Connected, Involved Citizens
Pittsburgh	PA	Digital Barriers	Low Cost, Efficient, Secure, and Resilient ICT
San Francisco	CA	Digital Barriers	Low Cost, Efficient, Secure, and Resilient ICT
Austin	TX	Digital Barriers	Connected, Involved Citizens
Austin	TX	N/A	Strategic Business Models and Partnering Opportunities
Kansas City	MO	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Portland	OR	Limited Data to Monitor the Transportation System	Connected, Involved Citizens
Kansas City	MO	N/A	Connected, Involved Citizens
Portland	OR	Unpredictable / Unreliable Transit Service	Smart Land Use
San Francisco	CA	Digital Barriers	Low Cost, Efficient, Secure, and Resilient ICT
Columbus	OH	N/A	Smart Land Use

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Ridesharing Options	Ridesharing Options			
Website	Website including blog and Dashboard			
Free Public Wi-Fi	Wireless sensor devices on smart street lights would serve as Wi-Fi hotspots.			
Wi-Fi on Buses	Free Wi-Fi on buses			
Training for Transportation Options and Technology	We will provide residents of public housing, who are in the process of receiving free Google Fiber service, with training on how to use online transportation options and tools; in order to help them travel to work, school, job training, healthcare visits, etc.			
Partnership with DOE	Investigate potential of Eves to provide grid services			
Congestion and Traffic Analytics	Congestion and Traffic Analytics			
Crowdsourced App	Crowdsourced app that can be adapted to a variety of questions such as "Where should kiosks be located?" or "Where are the most critical pedestrian crossings to improve?"			
Website	Public website			
Bus Rapid Transit (BRT)	Bus Rapid Transit (BRT)			
Free Public Wi-Fi	Expansion of public Wi-Fi.			
Smart Growth Initiatives	A variety of actions to induce greater use of public transit to ease parking and congestion in downtown area, including expanded use of BRT			

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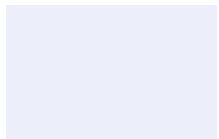
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San Francisco	CA	N/A	Connected Vehicles
Columbus	OH	Transit Collisions with Vehicles / Pedestrians	Connected Vehicles
Kansas City	MO	Response Times for First Responders	Connected Vehicles
Pittsburgh	PA	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs
Portland	OR	N/A	Strategic Business Models and Partnering Opportunities
Columbus	OH	Poor Lighting	Intelligent, Sensor-based Infrastructure
Portland	OR	Lack of Travel Options	User-Focused Mobility Services and Choices
Austin	TX	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs
Kansas City	MO	FMLM Challenges	Urban Automation
Kansas City	MO	Limited Data to Monitor the Transportation System	Connected, Involved Citizens

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	downtown area, including expanded use of BRT as flexible and low cost option compared to light rail and enhanced parking management. Parking app to help find and reserve parking in real time.				
CV Construction Vehicles	Construction vehicles	✓			
Mobileye Technology	Mobileye technology to be installed on 350 buses	✓			
Emergency Vehicle Preemption	Emergency Vehicle Preemption	✓			
EV TNC Partnership	Partner with Uber and other TNCs to support conversion of fleets to Evs			✓	
Partnership with Sidewalk Labs	Partnership with Sidewalk Labs		✓		
Smart Street Lights	Smart LED street lights that are Wi-Fi enabled and motion-responsive	✓		✓	
Carshare Options	Carshare Options		✓	✓	
EV Education and Promotional Events	Education/awareness campaigns.			✓	
Low Speed Automated Vehicles	Low speed electric AV shuttles on the 18th Street Corridor and on the 11th/12th Street Corridor. The shuttle system will connect to the current streetcar. Test corridor (20 miles) for connected and semi-autonomous vehicles from KCI Airport to the downtown area. L4 Shuttles up to 35 mph in mixed traffic.	✓	✓	✓	✓
Crowdsourced App	Crowdsourced app accessed through a smartphone, kiosk, or computer, to capture data, such as reports on potholes, unpaved roads,	✓	✓	✓	

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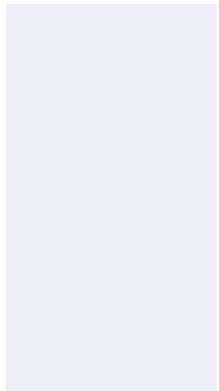
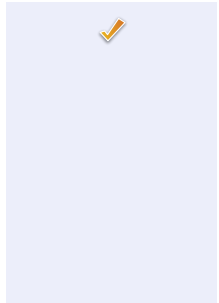
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San Francisco	CA	N/A	User-Focused Mobility Services and Choices
Pittsburgh	PA	Understanding Citizen Needs / Issues	Connected, Involved Citizens
Denver	CO	Understanding Citizen Needs / Issues	Connected, Involved Citizens
Denver	CO	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Austin	TX	Interoperability, Privacy, and Security	Architecture and Standards
Columbus	OH	Pedestrian / Bicyclist Safety and Mobility	Smart Land Use
Portland	OR	FMLM Challenges	Urban Automation

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	incidents, etc., in a cost effective manner.				
Gamification / Incentivization	Incentives for shared-use rides	✓	✓		
Community Outreach / Engagement	SmartPGH will work with Jackson/Clark Partners, a leading engagement, civic participation, and research firm, to gather quantitative and qualitative data to measure the performance of SmartPGH strategies and their impact on Pittsburgh's residents — and to ensure that these strategies can be replicated by other cities.				✓
Community Liaisons	Community-based Technical Working Group				✓
Data Management and Analytics Platform	The Enterprise Data Management (EDM) ecosystem will provide a large data repository to collect and process data. The EDM will combine big data and analytics, Internet of Things (IoT), and cloud-based services. The EDM will provide an environment to fuse a myriad of data sets and provide Data as a Service (DaaS) and Analytics as a Service (AaaS) through dashboard analytics tools.	✓	✓	✓	✓
Data Standards Working Group	Data Standards Working Group				
Bike Lanes	Bike trails	✓	✓	✓	
Low Speed Automated Vehicles	Semi- or fully -autonomous shuttles will focus on radial service from key transit stops providing connections to jobs. After successful deployment of larger shuttles, Portland plans to deploy	✓	✓	✓	✓

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Pittsburgh	PA	Lack of Traveler Information	User-Focused Mobility Services and Choices
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Pittsburgh	PA	Lack of Travel Options	User-Focused Mobility Services and Choices
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smaller, electrified and semiautonomous circulator routes.

Autonomous campus shuttles at the Oregon Museum of Science and Industry.

Semi-autonomous or even autonomous transit service to and from parking lots at Portland International Airport.

Taxi Information

MovePGH will provide residents and visitors with the ability to view comparable options across multiple modes such as public transportation, taxi, bikeshare, carshare, biking, walking, and driving and parking. Users will be able to compare travel options over categories such as real-time travel time, carbon emissions, construction detours, safety, and condition of travel paths (i.e., sidewalk presence or condition).

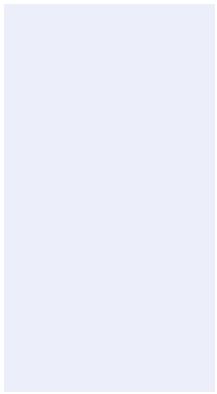


Bikeshare Options

MovePGH will provide residents and visitors with the ability to view comparable options across multiple modes such as public transportation, taxi, bikeshare, carshare, biking, walking, and driving and parking. Users will be able to compare travel options over categories such as real-time travel time, carbon emissions, construction detours, safety, and condition of travel paths (i.e., sidewalk presence or condition).



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Portland	OR	Limited Data to Monitor the Transportation System	Connected Vehicles
Portland	OR	Transit Collissions with Vehicles / Pedestrians	Connected Vehicles
Pittsburgh	PA	N/A	Strategic Business Models and Partnering Opportunities
Portland	OR	Digital Barriers	Connected, Involved Citizens
Austin	TX	Lack of Traveler Information	User-Focused Mobility Services and Choices
Denver	CO	N/A	Strategic Business Models and Partnering Opportunities
Austin	TX	Lack of Available Parking and/or Parking Information	Intelligent, Sensor-based Infrastructure
Kansas City	MO	N/A	Strategic Business Models and Partnering Opportunities
Columbus	OH	N/A	Smart Land Use
Portland	OR	Limited Data to Monitor the Transportation System	Connected Vehicles
Portland	OR	Data Storage and Management	Urban Analytics
Kansas City	MO	Limited Data to Monitor the Transportation System	Connected Vehicles
San Francisco	CA	Interoperability, Privacy, and Security	Low Cost, Efficient, Secure, and Resilient ICT
Portland	OR	Lack of Travel Options	User-Focused Mobility Services and Choices
San Francisco	CA	Understanding Citizen Needs / Issues	Connected, Involved Citizens

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CV Public Vehicles	The city, agency partners, FedEx, and other businesses with fleets will pilot connected vehicle technologies - no specific numbers	✓	✓	✓
Mobileye Technology	Equip Buses	✓		
Partnership with Academic	Partnership with CMU			
Instructional Videos	Contest for video on the Smart City			✓
Transit Information	Bus arrival information		✓	✓
Partnership with Mobileye	Mobileye Partnership	✓		
Real-Time Parking Data	Real-Time Parking Data		✓	✓
Partnership to Engage Small Businesses and DBEs	Partnership to Engage Small Businesses and DBEs			
Vision Zero Program	Safety Program	✓		
V2I Roadside Equipment	100's of intersections equipped with CV equipment	✓	✓	✓
AWS Cloud Hosting	AWS Cloud Hosting			
CV Private Vehicles	500 private vehicles	✓	✓	✓
SCMS	SCMS			
TNCs	TNCs		✓	✓
Community Outreach / Engagement	A comprehensive community engagement. Offering neighborhood Challenge, smart phone apps based, advisory committees. The city will			

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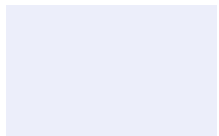
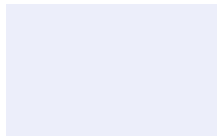
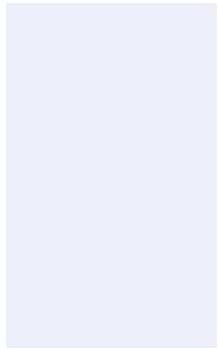
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Columbus	OH	Payment for Transportation for the Unbanked	User-Focused Mobility Services and Choices
Denver	CO	Freight Delays / Congestion	Connected Vehicles
Kansas City	MO	N/A	Strategic Business Models and Partnering Opportunities
Denver	CO	Siloed Data	Urban Analytics
Columbus	OH	N/A	Urban Automation
Denver	CO	Lack of Travel Options	User-Focused Mobility Services and Choices
Columbus	OH	N/A	Strategic Business Models and Partnering Opportunities
Austin	TX	Accessibility for People with Disabilities and the Elderly	User-Focused Mobility Services and Choices
Columbus	OH	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs

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	apps based, advisory committees. The city will engage with existing community advocacy groups and host public workshops in communities less accustomed to internet based public engagement. The city will also provide continuous support and technical assistance from outreach and technical teams. Also a 500 person focus group/panel to evaluate TaaS.				
Payment Cards for the Unbanked	Seamless payment card to assist the unbanked/underbanked population. The city has a partnership with local banks to roll out shared payment platform.		✓		✓
Freight Signal Priority	Freight Signal Priority		✓	✓	
Partnership with Sidewalk Labs	Partnership with Sidewalk Labs		✓		
Fusing Transportation Data with Non-Transportation Data	Fusing Transportation Data with Non-Transportation Data (public works)	✓	✓	✓	✓
AV Testing Facility	SPARC Facility and OSU Facility	✓			
Bikeshare Options	Connect underserved citizens with 10 new bike-sharing stations that will be placed in disadvantaged neighborhoods to fill FMLM gaps.		✓	✓	
Partnership with Sidewalk Labs	Sidewalk Labs Partnership		✓		
Apps for People with Disabilities	Provide scenario for a disabled resident; centralizing information for elderly and people with disabilities				✓
Energy Credits	Customers receive energy credits for supplying			✓	

Smart City Challenge Finalists Project Proposals



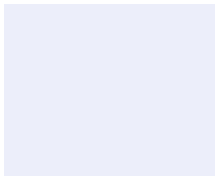
Smart City Challenge Finalists Project Proposals

Portland	OR	N/A	Low Cost, Efficient, Secure, and Resilient ICT
Kansas City	MO	Response Times for First Responders	Urban Analytics
Portland	OR	Siloed Data	Urban Analytics
Columbus	OH	Poor Air Quality / Harmful Vehicle Emissions	Smart Land Use
Columbus	OH	N/A	Connected, Involved Citizens
Portland	OR	N/A	Strategic Business Models and Partnering Opportunities
Kansas City	MO	Lack of Travel Options	User-Focused Mobility Services and Choices
Denver	CO	Lack of Travel Options	User-Focused Mobility Services and Choices
Pittsburgh	PA	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Austin	TX	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs
Austin	TX	Lack of EV Charging Infrastructure / Range Anxiety	Smart Grid, Roadway Electrification, and EVs
Pittsburgh	PA	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs
Columbus	OH	Limited Tools to Support Data Driven	Urban Analytics

Smart City Challenge Finalists Project Proposals

	excess energy to the smart grid				
Existing Fiber	Existing Fiber				
Gunshot Analytics	Gunshot analytics leveraging data from gunshot detectors.	✓			
Fusing Transportation Data with Non-Transportation Data	Fusing Transportation Data with Non-Transportation Data	✓	✓	✓	✓
Emissions Reduction Plan	Emissions Reduction Plan			✓	
Website	Website including blog and Dashboard				
Partnership with NXP	Partnership with NXP	✓	✓	✓	
TNCs	TNCs		✓	✓	
Ridesharing Options	Lyftline		✓	✓	✓
Probe Data Collection	Probe Data Collection		✓		
EV Taxi Partnership	Partnership with rideshare, taxis others to enhance EV penetration.			✓	
EV Charging Stations	partnered with Charge point Technologies to deploy a first of its kind Electric Vehicle Refueling Station.			✓	
Converting Public Fleets to EVs	City already has plans to purchase EVs; The Electric Avenue project will include purchase of a new EV fleet to be parked and charged at the City-owned Second Avenue parking lot.			✓	
Emissions and Air Quality Analytics	Leverage ODOT Data for estimates of emissions			✓	

Smart City Challenge Finalists Project Proposals



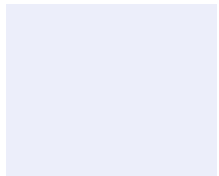
Smart City Challenge Finalists Project Proposals

Denver	CO	Decision Making FMLM Challenges	User-Focused Mobility Services and Choices
San Francisco	CA	N/A	Smart Land Use
Austin	TX	N/A	Connected Vehicles
Austin	TX	Lack of Interoperability of Payment Systems for Transportation Services	User-Focused Mobility Services and Choices
Pittsburgh	PA	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Kansas City	MO	Limited Tools to Support Data Driven Decision Making	Urban Analytics
San Francisco	CA	Poor Air Quality / Harmful Vehicle Emissions	Smart Grid, Roadway Electrification, and EVs
Pittsburgh	PA	N/A	Connected, Involved Citizens
Austin	TX	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Kansas City	MO	Barriers to Employment/Education, and Other Services	Connected, Involved Citizens
Portland	OR	Freight Delays / Congestion	Urban Delivery and Logistics
Austin	TX	N/A	Strategic Business Models and Partnering Opportunities
Denver	CO	Lack of Travel Options	User-Focused Mobility Services and Choices

Smart City Challenge Finalists Project Proposals

FMLM Connections to Transit	FMLM Connections to Transit			
Smart Growth Initiatives	Smart Growth Initiatives			
Incident Scene Work Zone Alerts	Incident Scene Work Zone Alerts			
Integrated Payment	Fully integrated payment platform.			
CCTV Cameras	CCTV Cameras			
Crash Analytics	Leverage Mobileye			
GreenCar App	My GreenCar App			
Website	Website			
Probe Data Collection	From third party providers			
Educations Offering (from Kiosks)	Kiosks will provide information on city services, current events, transportation services, local business information, public digital art, local history, and entertainment.			
Truck Routing / Traveler Information	FedEx and FedEx Ground will enhance sharing of operations data with trucks acting as probes to track traffic activity and connect to the City's traffic management center.			
Partnership with NXP	NXP Partnership			
TNCs	TNCs			

Smart City Challenge Finalists Project Proposals



Smart City Challenge Finalists Project Proposals

Austin	TX	Interoperability, Privacy, and Security	Low Cost, Efficient, Secure, and Resilient ICT
Columbus	OH	Freight Delays / Congestion	Urban Delivery and Logistics
Portland	OR	Digital Barriers	Connected, Involved Citizens
Kansas City	MO	N/A	Strategic Business Models and Partnering Opportunities
Portland	OR	FMLM Challenges	User-Focused Mobility Services and Choices
Portland	OR	N/A	Connected Vehicles
Kansas City	MO	Vehicle / Vehicle Collisions (intersections)	Connected Vehicles
Portland	OR	N/A	Smart Land Use
Kansas City	MO	Payment for Transportation for the Unbanked	User-Focused Mobility Services and Choices
Pittsburgh	PA	Limited Data to Monitor the Transportation System	Connected Vehicles
Portland	OR	Workforce Training / Development	Connected, Involved Citizens
Pittsburgh	PA	Lack of Travel Options	Smart Grid, Roadway Electrification, and EVs
Denver	CO	Digital Barriers	Connected, Involved Citizens
San Francisco	CA	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Columbus	OH	N/A	Strategic Business Models and Partnering Opportunities
Austin	TX	Limited Tools to Support Data Driven	Urban Analytics

Smart City Challenge Finalists Project Proposals

Approach to Data Security and Privacy	Approach to Data Security and Privacy			
Platoon Signal Priority	Signal Priority for Platooning Trucks	✓	✓	
Free Smartphones for the Underserved	Provide low-cost or free phones to people in underserved communities			✓
Partnership with Service / Equipment Vendors	Partnership with Service / Equipment Vendors; Cisco			
FMLM Connections to Transit	FMLM Connections to Transit	✓		✓
CV Taxis	Taxis	✓	✓	✓
Intersection Movement Assist (IMA)	Intersection Movement Assist (IMA)	✓		
Smart Growth Initiatives	Smart Growth Initiatives		✓	✓
Payment Cards for the Unbanked	Smart payment card to support integrated payment.		✓	✓
CV Onboard Equipment (Total)	726 vehicle equipped with DSRC	✓	✓	✓
Training and Programs to Link People to Jobs	Training and Programs to Link People to Jobs			✓
Electric Motorcycles	10 electric motorcycles purchased by public agency			✓
Training for Transportation Options and Technology	Create distinct engagement and education strategies for each project.		✓	✓
Developer Platform (APIs and SDKs)	Developer Platform (APIs and SDKs)			
Partnership with Amazon Web Services	Amazon Web Services Partnership			
Sidewalk Labs Flow Platform	Mobility analytics platform developed in	✓		

Smart City Challenge Finalists Project Proposals



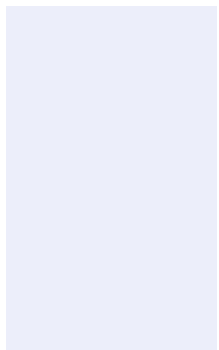
Smart City Challenge Finalists Project Proposals

		Decision Making	
Columbus	OH	Freight Delays / Congestion	Urban Delivery and Logistics
Austin	TX	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
San Francisco	CA	Freight Delays / Congestion	Urban Delivery and Logistics
Denver	CO	Lack of EV Charging Infrastructure / Range Anxiety	Smart Grid, Roadway Electrification, and EVs
San Francisco	CA	Lack of Travel Options	User-Focused Mobility Services and Choices
Columbus	OH	Lack of Travel Options	User-Focused Mobility Services and Choices
Austin	TX	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Kansas City	MO	Limited Tools to Support Data Driven Decision Making	Urban Analytics
San Francisco	CA	Limited Tools to Support Data Driven	Urban Analytics

Smart City Challenge Finalists Project Proposals

	partnership with Sidewalk Labs.		✓		
Freight Signal Priority	Freight Signal Priority		✓	✓	
DSRC Equipment	V2I Equipment	✓	✓	✓	
Truck Routing / Traveler Information	Delivery Service Feature in app will be embedded into the TaaS platform and be used to improve the efficiency of freight delivery and logistics planning. The application will provide feedback to the driver on optimal route choice and delivery times as well as incidents that may delay delivery.		✓		
Pre-Wiring Homes for EV Charging	Pre-Wiring Homes for EV Charging			✓	
Carshare Options	Carshare Options		✓	✓	
e-Bikes	DSRC Pedal-assisted bikes		✓	✓	
Performance Measure Dashboard	Dashboard to monitor performance	✓	✓	✓	✓
Data Management and Analytics Platform	Cisco Digital Platform (CDP) has the ability to aggregate data from multiple sensor networks, such as parking and lighting, and make that information available in standardized formats and APIs. The Quantified Community will create an experimental environment that provides a testing ground for new informatics technologies and analytics capabilities.	✓	✓	✓	✓
Data Management and Analytics Platform	UC Berkeley researchers will develop a modular	✓	✓	✓	✓

Smart City Challenge Finalists Project Proposals



Smart City Challenge Finalists Project Proposals

Decision Making

Columbus	OH	Unpredictable / Unreliable Transit Service	Connected Vehicles
San Francisco	CA	N/A	Smart Land Use
Columbus	OH	Lack of Traveler Information	User-Focused Mobility Services and Choices
San Francisco	CA	N/A	Strategic Business Models and Partnering Opportunities
Denver	CO	Lack of EV Charging Infrastructure / Range Anxiety	Smart Grid, Roadway Electrification, and EVs
Austin	TX	Payment for Transportation for the Unbanked	User-Focused Mobility Services and Choices
Kansas City	MO	N/A	Strategic Business Models and Partnering Opportunities
San Francisco	CA	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs
Portland	OR	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Columbus	OH	N/A	Strategic Business Models and Partnering Opportunities
Austin	TX	Lack of Traveler Information	User-Focused Mobility Services and Choices

Smart City Challenge Finalists Project Proposals

architecture to support a data commons that will allow management, discovery, sharing, use/re-use, and general consumption of mobility data. There are three key components to this research: (i) Data analytics and machine learning enabled decision making, (ii) Data warehouse and real-time processing; and (iii) Dashboards and visualization.

CV Buses	350 buses			
Vision Zero Program	Vision Zero Program			
Traffic Information	Real-Time Traffic Information			
Partnership to Engage Small Businesses and DBEs	Partnership to Engage Small Businesses and DBEs			
Wireless Inductive Charging	RTD and NREL will lead a design study to define how wireless charging en-route can enhance electric bus functionality and operating range.			
Payment Cards for the Unbanked	Payment Cards for the Unbanked			
Partnership with NXP	Partnership with NXP			
EV Education and Promotional Events	EV Education and Promotional Events			
Congestion and Traffic Analytics	Congestion and Traffic Analytics			
Partnership with Academic	Ohio State University			
Turn-by-Turn Directions	When booking a calendar appointment the application would prompt him			

Smart City Challenge Finalists Project Proposals



Smart City Challenge Finalists Project Proposals

Austin	TX	Vehicle / Vehicle Collisions (non-intersections)	Connected Vehicles
San Francisco	CA	Poor Air Quality / Harmful Vehicle Emissions	Smart Land Use
Columbus	OH	Poor Roadway / Pavement Conditions	Intelligent, Sensor-based Infrastructure
Columbus	OH	Digital Barriers	Connected, Involved Citizens
Kansas City	MO	Poor Air Quality / Harmful Vehicle Emissions	Smart Grid, Roadway Electrification, and EVs
Portland	OR	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Pittsburgh	PA	Unpredictable / Unreliable Transit Service	Smart Land Use
Kansas City	MO	Pedestrian / Bicyclist Safety	Intelligent, Sensor-based Infrastructure
Austin	TX	N/A	Strategic Business Models and Partnering Opportunities
Columbus	OH	Limited Tools to Support Data Driven Decision Making	Urban Analytics

Smart City Challenge Finalists Project Proposals

	application would prompt him with travel options based on selected metrics. The app could provide turn-by-turn multimodal navigation and adjust its prompts based on user preferences and needs.				
Emergency Electronic Brake Light Warning	Emergency Electronic Brake Light Warning	✓			
Emissions Reduction Plan	Emissions Reduction Plan			✓	
Pothole and Roadway Condition Data	Collected from Mobileye Equipment	✓			
Training for Transportation Options and Technology	Technology and transportation option training.		✓		✓
EV Police Vehicles (Parking Enforcement and Non-Cruisers)	KCPD will purchase EVs for parking enforcement and non-cruiser fleet vehicles.			✓	
CCTV Cameras	CCTV Cameras	✓	✓		
Bus Rapid Transit (BRT)	Bus Rapid Transit (BRT)		✓	✓	✓
Pedestrian Detectors (intersections)	Pedestrian sensors	✓			
Partnership to Engage Small Businesses and DBEs	City of Austin as “first customer” for startups, small businesses; Leverage SXSW, SXSW Eco Startup Showcase, Defense Innovation Summit, and other conferences to identify new technologies and entrepreneurs in transportation/mobility.				
Crash Analytics	Crash Analytics leveraging Mobileye	✓			

Smart City Challenge Finalists Project Proposals



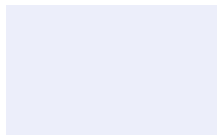
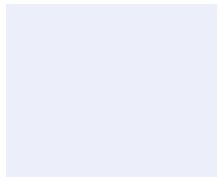
Smart City Challenge Finalists Project Proposals

Kansas City	MO	N/A	Smart Land Use
Portland	OR	N/A	User-Focused Mobility Services and Choices
Denver	CO	Poor Air Quality / Harmful Vehicle Emissions	Smart Grid, Roadway Electrification, and EVs
Kansas City	MO	N/A	Strategic Business Models and Partnering Opportunities
Portland	OR	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Columbus	OH	Unsafe Bus Stops	Intelligent, Sensor-based Infrastructure
Portland	OR	N/A	Strategic Business Models and Partnering Opportunities
Pittsburgh	PA	Data Storage and Management	Urban Analytics
Austin	TX	Lack of Traveler Information	User-Focused Mobility Services and Choices
San Francisco	CA	N/A	Strategic Business Models and Partnering Opportunities
Columbus	OH	Lack of Available Parking and / or Parking Information for Delivery Vehicles	Urban Delivery and Logistics
Columbus	OH	N/A	Strategic Business Models and Partnering Opportunities
Columbus	OH	Freight Delays / Congestion	Urban Delivery and Logistics
Columbus	OH	Digital Barriers	Low Cost, Efficient, Secure, and Resilient ICT
Portland	OR	Complexity of Planning / Completing a Trip	User-Focused Mobility Services and Choices

Smart City Challenge Finalists Project Proposals

Road Diets	Road Diets	✓	✓	✓
Gamification / Incentivization	Incentives for Carshare / Bikeshare; also includes incentives for transit on code red air quality days.		✓	✓
Hydrogen Opportunity Analysis	Hydrogen Opportunity Analysis			✓
Partnership with Public Agency	Missouri DOT and KDOT (road to Tomorrow Initiative).			
Developer Platform (APIs and SDKs)	APIs			
Pedestrian Detectors (bus stops)	Pedestrian detection at bus stops	✓		
Partnership with Public Agency	Partnership with Public Agency			
AWS Cloud Hosting	AWS Cloud Hosting			
Transit Options	Bus, Rail, Paratransit		✓	✓
Partnership with Sidewalk Labs	Partnership with Sidewalk Labs		✓	
Truck Parking Information (Urban)	Truck Smart Parking Services (TSPS) real-time parking availability service for freight delivery that includes equipping loading zones with machine vision detection and a reservation service.		✓	✓
Partnership with DOE	DOE Partnership			✓
Truck Routing / Traveler Information	Intelligent truck warning and routing system to help minimize incidents due to low bridges or narrow roads.	✓	✓	✓
Free Public Wi-Fi	Public Wi-Fi in street lamps and Kiosks			✓
Mobility Marketplace	The Mobility Marketplace will make		✓	✓

Smart City Challenge Finalists Project Proposals



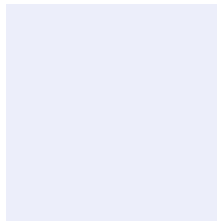
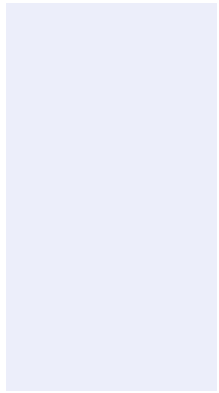
Smart City Challenge Finalists Project Proposals

San Francisco	CA	Unpredictable / Unreliable Transit Service	Connected Vehicles
Denver	CO	Freight Delays / Congestion	Connected Vehicles
San Francisco	CA	FMLM Challenges	User-Focused Mobility Services and Choices
Denver	CO	Freight Delays / Congestion	Urban Delivery and Logistics
Columbus	OH	Limited Tools to Support Data Driven Decision Making	Urban Analytics

Smart City Challenge Finalists Project Proposals

	comprehensive, streamlined travel information universally available. Using integrated data from a variety of open sources, the Mobility Marketplace will help Portlanders meet their daily travel needs with a seamless set of multimodal services. The UB Mobile PDX app will help users pick the right mode and route for their trip whether they value time, distance, carbon footprint, safety, mobility device access, air quality, or health benefits.				
Transit Signal Priority	Transit Signal Priority		✓	✓	
CV Trucks	Trucks	✓	✓	✓	
FMLM Connections to Transit	FMLM Connections to Transit		✓		✓
Truck Routing / Traveler Information	Travel Time Reliability for Connected Freight including regularly updated and defined routes for all freight traffic. Enhanced data collection capabilities to understand, assess and respond to freight movement through Denver communities.	✓	✓	✓	
Data Management and Analytics Platform	Integrated Data Exchange (IDE) is a dynamic platform integrating data from deployed smart technologies and community partners offering an open source information portal. The IDE combines transportation data and other sources. The IDE IDE will serve as a platform for analytics. The Smart Columbus website to relay progress through a regular blog and dash board that reports numbers of participants, community	✓	✓	✓	✓

Smart City Challenge Finalists Project Proposals



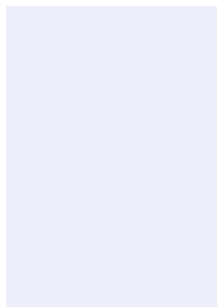
Smart City Challenge Finalists Project Proposals

Denver	CO	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs
Kansas City	MO	Lack of Travel Options	User-Focused Mobility Services and Choices
Columbus	OH	FMLM Challenges	Urban Automation
Columbus	OH	Vehicle / Vehicle Collisions (non-intersections)	Connected Vehicles
Denver	CO	Poor Air Quality / Harmful Vehicle Emissions	Smart Grid, Roadway Electrification, and EVs
Austin	TX	Unpredictable / Unreliable Transit Service	Smart Land Use
Columbus	OH	FMLM Challenges	User-Focused Mobility Services and Choices
Denver	CO	Limited Tools to Support Data Driven Decision Making	Urban Analytics
San Francisco	CA	Limited Tools to Support Data Driven Decision Making	Urban Analytics

Smart City Challenge Finalists Project Proposals

	engagement opportunities, and data/transportation metrics.				
Converting Public Fleets to EVs	Purchase 103 EVs for city fleet.			✓	
Carshare Options	Carshare		✓	✓	
Low Speed Automated Vehicles	Low speed Electric Autonomous Vehicles (EAVs) to support first mile / last mile (FMLM) connections - including wheel chair accessible vehicles - deployed in a mixed-use environment. Three fixed routes are proposed with linkages to the CMAX BRT.	✓	✓	✓	✓
Forward Collision Warning	Forward Collision Warning	✓			
Electric Buses	Nine electric buses on one of the busiest corridors.			✓	
Bus Rapid Transit (BRT)	Bus Rapid Transit (BRT)		✓	✓	✓
FMLM Connections to Transit	FMLM leveraging EAVs and other solutions		✓		✓
Sidewalk Labs Flow Platform	Sidewalk Labs Flow analytics platform. Flow will serve as a platform that ingests a wealth of data from a variety of sources – sensors, cameras, third-party apps – and uses analytics to let cities map assets against demands. Flow data will be fed into the EDM Ecosystem.		✓		
Sidewalk Labs Flow Platform	Sidewalk Labs Flow Platform		✓		








Smart City Challenge Finalists Project Proposals



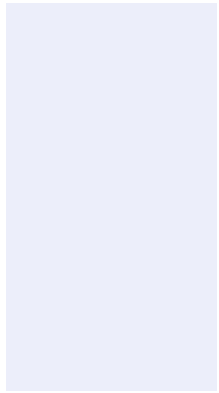
Smart City Challenge Finalists Project Proposals

Portland	OR	Lack of Traveler Information	User-Focused Mobility Services and Choices
Columbus	OH	Lack of EV Charging Infrastructure / Range Anxiety	Smart Grid, Roadway Electrification, and EVs
Austin	TX	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Portland	OR	N/A	Strategic Business Models and Partnering Opportunities
Kansas City	MO	N/A	Strategic Business Models and Partnering Opportunities
Columbus	OH	Understanding Citizen Needs / Issues	Connected, Involved Citizens
Portland	OR	N/A	Strategic Business Models and Partnering Opportunities
Portland	OR	N/A	Strategic Business Models and Partnering Opportunities
Denver	CO	Interoperability, Privacy, and Security	Low Cost, Efficient, Secure, and Resilient ICT

Smart City Challenge Finalists Project Proposals

Traveler Information Kiosks	100 Sidewalk Labs kiosks within and near the three demonstration corridors. Kiosks will include the following: (i) free broadband internet access, (ii) high-speed phone and device charging, (iii) a tablet with information on transportation, housing, and other social services, and (iv) Real-time alerts and information on bus or train arrivals, traffic disruptions, air quality alerts, and emergency response information.			
EV Charging Stations	To support CMAX			
CCTV Cameras	Cameras			
Partnership with Academic	Portland State University			
Partnership with Amazon Web Services	Partnership with Amazon Web Services			
Community Liaisons	Team liaisons will appointed to each district to ensure the community is informed, engaged, and has one point of contact. A paid print, electronic, and social media public awareness and incentive campaign			
Smart City Forum / Institute	Partnership with Seattle, LA, and New Orleans, and Richmond			
Partnership to Engage Small Businesses and DBEs	Challenge to engage start-ups.			
SCMS	Security Management System			

Smart City Challenge Finalists Project Proposals



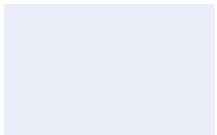
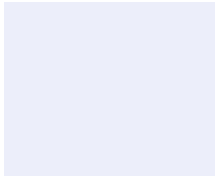
Smart City Challenge Finalists Project Proposals

Denver	CO	N/A	Strategic Business Models and Partnering Opportunities
Portland	OR	Poor Air Quality / Harmful Vehicle Emissions	Connected Vehicles
Kansas City	MO	Lack of Travel Options	User-Focused Mobility Services and Choices
Kansas City	MO	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Denver	CO	Lack of EV Charging Infrastructure / Range Anxiety	Smart Grid, Roadway Electrification, and EVs
Kansas City	MO	N/A	Low Cost, Efficient, Secure, and Resilient ICT
San Francisco	CA	Digital Barriers	Connected, Involved Citizens
Columbus	OH	N/A	Strategic Business Models and Partnering Opportunities
Portland	OR	Complexity of Planning / Completing a Trip	User-Focused Mobility Services and Choices
Kansas City	MO	N/A	Smart Land Use
Portland	OR	N/A	Strategic Business Models and Partnering Opportunities
San Francisco	CA	Pedestrian / Bicyclist Safety	Connected Vehicles
Austin	TX	Language Barriers	User-Focused Mobility Services and Choices
San Francisco	CA	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs

Smart City Challenge Finalists Project Proposals

Partnership with Amazon Web Services	AWS Partnership				
Eco-Approach and Departure at Signalized Intersections	Eco-Approach and Departure at Signalized Intersections				✓
Ridesharing Options	Smart phone applications for micro-carpooling will create added mobility services.		✓	✓	
DSRC Equipment	V2X Equipment	✓	✓	✓	
EV Charging Stations	The city will engage partners to deploy best-in-class resources – including 120 charging stations – to at least three residential developments. DC FastCharger Network.				✓
Existing Fiber	Existing Fiber Backbone				
Training for Transportation Options and Technology	Training for Transportation Options and Technology				
Partnership with NXP	NXP Partnership; RSUs, ASDs, SDKs, RFID	✓	✓	✓	
Multimodal Hubs / Stations	Integrated electric mobility hubs with charging equipment for BIKETOWN e-bikes and EV charging.		✓		✓
Smart Growth Initiatives	Smart Growth Initiatives		✓	✓	
Partnership with Amazon Web Services	Partnership with Amazon Web Services				
Pedestrian Detection and Warning	Pedestrian Detection and Warnings	✓			
Multilingual Applications	Multilingual Applications				✓
EV Bulk Buy Program	EV Bulk Buy Program			✓	

Smart City Challenge Finalists Project Proposals



Smart City Challenge Finalists Project Proposals

San Francisco	CA	Lack of Available Parking and / or Parking Information for Delivery Vehicles	Urban Delivery and Logistics
Columbus	OH	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Pittsburgh	PA	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Denver	CO	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Kansas City	MO	Unpredictable / Unreliable Transit Service	Smart Land Use
Austin	TX	Complexity of Planning / Completing a Trip	User-Focused Mobility Services and Choices
Pittsburgh	PA	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Austin	TX	Lack of Available Parking and/or Parking Information	User-Focused Mobility Services and Choices
Pittsburgh	PA	Interoperability, Privacy, and Security	Architecture and Standards
Portland	OR	Pedestrian / Bicyclist Safety and Mobility	Smart Land Use
Portland	OR	Limited Tools to Support Data Driven Decision Making	Urban Analytics

Smart City Challenge Finalists Project Proposals

Truck Parking Information (Urban)	Truck Parking Information (Urban)	✓			
Hackathons	Hackathons				
Emissions and Air Quality Analytics	Air quality sensors would support emissions analysis.			✓	
Congestion and Traffic Analytics	Congestion and Traffic Analytics	✓			
Bus Rapid Transit (BRT)	BRT Line	✓	✓		✓
Mobility Marketplace	Moovel has already taken first steps to integrate multi-modal planning, choice, and payment into one mobile application, and Capital Metro's mobile application is advancing in a similar direction.	✓	✓		✓
Environmental Sensors	Air quality monitoring sensors integrated with smart street lights.			✓	
Dynamic Pricing for Parking	Dynamic parking pricing at the hubs will support prioritization for carsharing, vanpooling, and rideshare or automated vehicle pick-up and drop off.	✓	✓		
Standards and Architecture	Commitment to using existing standards and architectures.				
Bike Lanes	Bike Lanes	✓	✓	✓	
Data Management and Analytics Platform	UB Mobile PDX will capture data and develop urban analytics to help direct city actions and investments to improve mobility for everyone	✓	✓	✓	✓

Smart City Challenge Finalists Project Proposals



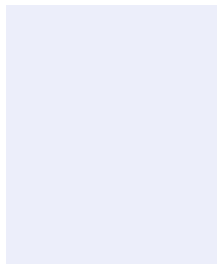
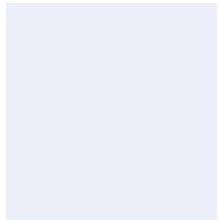
Smart City Challenge Finalists Project Proposals

Columbus	OH	Freight Delays / Congestion	Urban Automation
Denver	CO	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Denver	CO	Freight Delays / Congestion	Urban Delivery and Logistics
Columbus	OH	Complexity of Planning / Completing a Trip	User-Focused Mobility Services and Choices
Austin	TX	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Portland	OR	N/A	Strategic Business Models and Partnering Opportunities
Austin	TX	N/A	Low Cost, Efficient, Secure, and Resilient ICT
San Francisco	CA	Lack of Travel Options	Urban Delivery and Logistics
Columbus	OH	Limited Tools to Support Data Driven Decision Making	Urban Analytics

Smart City Challenge Finalists Project Proposals

	whether in a car, on a bike, on foot, on a bus, or using a mobility device. The Open Data Cloud analytics platform will function in tandem with the data and analytics provided by Sidewalk Labs to offer an open source alternative.				
Truck Platooning	Peloton - V2V platooning of two trucks.		✓	✓	
CCTV Cameras	CCTV Cameras	✓	✓		
Freight Signal Priority	Freight Signal Priority		✓	✓	
Multimodal Hubs / Stations	Neighborhood Hubs will provide a variety of transportation options to facilitate FMLM connections, as well as access to the jobs and amenities. Parking facilities at hubs would include electric charging stations (estimated 2 per station per transit center)		✓		✓
Congestion and Traffic Analytics	Real-time data analysis and visualizations to optimize performance of transportation services across modes		✓		
Partnership with Service / Equipment Vendors	Partnership with Service / Equipment Vendors				
Existing Fiber	Existing Fiber				
AV for Delivery and Municipal Services	Automated vehicles for "delivery or municipal services".		✓		
Performance Measure Dashboard	Performance Measure Dashboard thru IDE	✓	✓	✓	✓

Smart City Challenge Finalists Project Proposals



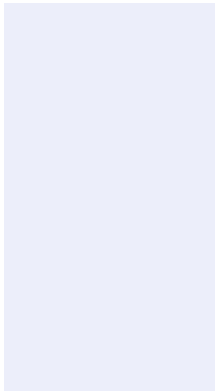
Smart City Challenge Finalists Project Proposals

		Decision Making	
Austin	TX	N/A	Strategic Business Models and Partnering Opportunities
Columbus	OH	N/A	Strategic Business Models and Partnering Opportunities
Austin	TX	Poor Air Quality / Harmful Vehicle Emissions	Smart Land Use
San Francisco	CA	Lack of Travel Options	User-Focused Mobility Services and Choices
San Francisco	CA	Lack of Travel Options	User-Focused Mobility Services and Choices
Portland	OR	Lack of Interoperability of Payment Systems for Transportation Services	User-Focused Mobility Services and Choices
San Francisco	CA	Complexity of Planning / Completing a Trip	User-Focused Mobility Services and Choices
San Francisco	CA	Vehicle / Vehicle Collisions (non-intersections)	Connected Vehicles
Kansas City	MO	Interoperability, Privacy, and Security	Low Cost, Efficient, Secure, and Resilient ICT

Smart City Challenge Finalists Project Proposals

Partnership with Academic	Community College and Texas A&M			
Partnership with OEM	Honda to install CV equipment			
Emissions Reduction Plan	NetZero 2050 Plan		✓	
Late Night Worker Vanpools	Shared van shuttle service demonstration proposal consisting of two components: (i) late night worker van shuttles between late night worker hotspots in San Francisco and dense neighborhoods in the outer parts of the City and (ii) after school van shuttles will operate similarly to a vanpool service or as a flexible microtransit system for elementary and middle school students.	✓		✓
Bikeshare Options	Bikeshare Options	✓	✓	
Integrated Payment	Fully integrated payment platform.	✓		✓
Multimodal Hubs / Stations	50 small shared mobility hubs in selected neighborhoods, linked to Wi-Fi hotspots, containing carsharing, bikesharing, and scooter sharing vehicles, as well as carpool/taxi/ridesourcing service and delivery curb space zones.	✓	✓	✓
Forward Collision Warning	Forward Collision Warning	✓		
Approach to Data Security and Privacy	Approach to Data Security and Privacy			











Smart City Challenge Finalists Project Proposals



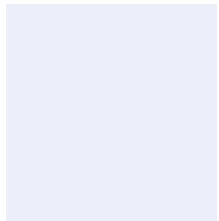
Smart City Challenge Finalists Project Proposals

Pittsburgh	PA	Accessibility for People with Disabilities and the Elderly	Smart Land Use
Denver	CO	Interoperability, Privacy, and Security	Low Cost, Efficient, Secure, and Resilient ICT
Austin	OH	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs
Austin	TX	Interoperability, Privacy, and Security	Low Cost, Efficient, Secure, and Resilient ICT
Austin	TX	N/A	User-Focused Mobility Services and Choices
Austin	TX	Interoperability, Privacy, and Security	Architecture and Standards
Portland	OR	Lack of Travel Options	User-Focused Mobility Services and Choices
Austin	TX	Freight Delays / Congestion	Urban Delivery and Logistics
Columbus	OH	Limited Tools to Support Data Driven Decision Making	Urban Analytics

Smart City Challenge Finalists Project Proposals

ADA Upgrades at Intersections	To support Surtrac intersections.			
Approach to Data Security and Privacy	Approach to Data Security and Privacy; mention NIST; cloud security elements (AWS)			
EV TNC Partnership	EV TNC Partnership			
SCMS	Security Management System			
Gamification / Incentivization	The City will be able to actively encourage and incentivize (e.g., through targeted subsidies) new pilot services and tools based on prioritized metrics Carbon footprint and population-weighted access to jobs.			
Standards and Architecture	Will use the ITS architecture and comply with the USDOT recommended industry standards for DSRC devices communication and ensure that security for all non-DSRC based V2X and IOT devices comply with relevant industry standards and best practices.			
Bikeshare Options	Bikeshare Options; Spinlister			
Truck Routing / Traveler Information	Real-time information to help optimize routes for freight vehicles. Urban Delivery Exchange website set up to accommodate voluntary ("pull") engagement with the marketplace by providers and users.			
Transit Analytics	Routes can be optimized			

Smart City Challenge Finalists Project Proposals



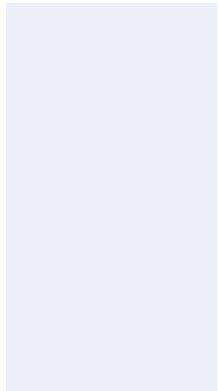
Smart City Challenge Finalists Project Proposals

Pittsburgh	PA	Limited Data to Monitor the Transportation System	Connected Vehicles
Columbus	OH	Unpredictable / Unreliable Transit Service	Smart Land Use
Portland	OR	Lack of Traveler Information	User-Focused Mobility Services and Choices
Columbus	OH	Unpredictable / Unreliable Transit Service	User-Focused Mobility Services and Choices
Austin	TX	Limited Data to Monitor the Transportation System	Connected Vehicles
Kansas City	MO	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
San Francisco	CA	Freight Delays / Congestion	Connected Vehicles
Kansas City	MO	Decarbonization of the Grid	Smart Grid, Roadway Electrification, and EVs
Columbus	OH	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Portland	OR	Interoperability, Privacy, and Security	Low Cost, Efficient, Secure, and Resilient ICT

Smart City Challenge Finalists Project Proposals

V2I Roadside Equipment	188 intersections equipped with advanced technologies	✔	✔	✔	
Bus Rapid Transit (BRT)	Plans to leverage future BRT service		✔	✔	✔
Traffic Information	100 Sidewalk Labs kiosks within and near the three demonstration corridors. Kiosks will include the following: (i) free broadband internet access, (ii) high-speed phone and device charging, (iii) a tablet with information on transportation, housing, and other social services, and (iv) Real-time alerts and information on bus or train arrivals, traffic disruptions, air quality alerts, and emergency response information.		✔		
Connection Protection	Connection Protection providing coordination between transportation providers, increasing the likelihood of making successful inter-modal, intra-modal transit transfers.		✔		
CV Onboard Equipment (Total)	4,000 vehicles equipped with DSRC	✔	✔	✔	
Probe Data Collection	Probe Data Collection		✔		
Freight Signal Priority	Freight Signal Priority		✔	✔	
Solar Canopy at Bus Stops	Solar Canopy at Bus Stops.			✔	
CCTV Cameras	Ohio DOT CCTV Cameras	✔	✔		
SCMS	SCMS				

Smart City Challenge Finalists Project Proposals



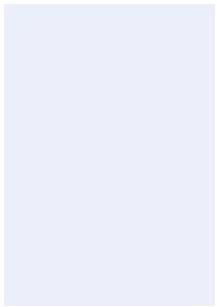
Smart City Challenge Finalists Project Proposals

Portland	OR	Limited Tools to Support Data Driven Decision Making	Urban Analytics
San Francisco	CA	Lack of Available Parking and/or Parking Information	User-Focused Mobility Services and Choices
Denver	CO	FMLM Challenges	User-Focused Mobility Services and Choices
Portland	OR	Complexity of Planning / Completing a Trip	Connected, Involved Citizens
Austin	TX	N/A	Strategic Business Models and Partnering Opportunities
Austin	TX	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Austin	TX	FMLM Challenges	Urban Automation
Pittsburgh	PA	Transit Collissions with Vehicles / Pedestrians	Connected Vehicles
Columbus	OH	N/A	Strategic Business Models and Partnering Opportunities
Portland	OR	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs

Smart City Challenge Finalists Project Proposals

Transportation Planning Analytics	Planning analytical scenarios include demand modeling, land use, project planning, etc.	✓	✓	✓	✓
Parking Management and Information	A Smart Parking feature will be embedded into the TaaS platform used to intelligently manage the supply and demand of parking.		✓	✓	
FMLM Subsidies	Lyft subsidies for first mile / last mile connections.		✓		✓
Subsidies for Travel Services	ADA subsidies for shared rides				✓
Partnership with Service / Equipment Vendors	Various partnerships				
Transportation Planning Analytics	Users and channels will provide simple inputs that will enable the platform to assess performance in terms of selected metrics.	✓	✓	✓	✓
Low Speed Automated Vehicles	Automated pods/shuttles will be tested at the Airport and then potentially moved to provide first mile / last mile (FMLM) from the Smart Station. Will radiate into surrounding neighborhoods to bring commuters to Smart Stations, connecting them with other transit options and a variety of connected & automated transportation services.	✓	✓	✓	✓
Mobileye Technology	Mobileye technology on buses (726)	✓			
Partnership with Service / Equipment Vendors	Econonolite, HERE, INRIX, Mass Factory, Peloton				
Converting Public Fleets to EVs	Continuing transition of Portland's Fleet to EVs and expanding electrification to medium- and heavier-duty vehicles (taxis and buses).			✓	





















Smart City Challenge Finalists Project Proposals



Smart City Challenge Finalists Project Proposals

Pittsburgh	PA	N/A	Urban Automation
Pittsburgh	PA	Lack of Travel Options	User-Focused Mobility Services and Choices
Portland	OR	Limited Data to Monitor the Transportation System	Connected Vehicles
Columbus	OH	Limited Data to Monitor the Transportation System	Connected Vehicles
Columbus	OH	Understanding Citizen Needs / Issues	Connected, Involved Citizens
Denver	CO	N/A	Strategic Business Models and Partnering Opportunities
Portland	OR	Natural Events (i.e., Earthquakes)	Intelligent, Sensor-based Infrastructure
Columbus	OH	N/A	Strategic Business Models and Partnering Opportunities
San Francisco	CA	Limited Data to Monitor the Transportation System	Connected Vehicles
Portland	OR	Freight Delays / Congestion	Connected Vehicles
San Francisco	CA	N/A	Strategic Business Models and Partnering Opportunities
Pittsburgh	PA	FMLM Challenges	Connected, Involved Citizens

Smart City Challenge Finalists Project Proposals

AV Testing Facility	AV Testing Facility				
Carshare Options	MovePGH will provide residents and visitors with the ability to view comparable options across multiple modes such as public transportation, taxi, bikeshare, carshare, biking, walking, and driving and parking. Users will be able to compare travel options over categories such as real-time travel time, carbon emissions, construction detours, safety, and condition of travel paths (i.e., sidewalk presence or condition).				
CV Private Vehicles	Private light vehicles				
CV Onboard Equipment (Total)	3,000 vehicles equipped with DSRC				
Community Outreach / Engagement	Outreach to community				
Partnership to Engage Small Businesses and DBEs	SMART Council - smal businesses and start-ups; SPARK (engage start-ups)				
Seismic Sensors	Sensors to pick up vibrations of earthquakes, etc.				
Partnership with Public Agency	Franklin County, Ohio DOT				
V2I Roadside Equipment	V2I Equipment at 100 intersections				
Freight Signal Priority	Freight Signal Priority				
Partnership with Vulcan	Partnership with Vulcan				
FMLM Connections and Shuttles to Healthcare Clinics	FMLM Connections and Shuttles to Healthcare Clinics				

Smart City Challenge Finalists Project Proposals



Smart City Challenge Finalists Project Proposals

Austin	TX	Pedestrian / Bicyclist Safety and Mobility	Smart Land Use
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Austin	TX	Freight Delays / Congestion	Urban Delivery and Logistics
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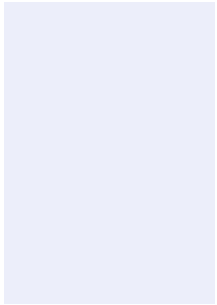
Columbus	OH	Complexity of Planning / Completing a Trip	User-Focused Mobility Services and Choices
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Kansas City	MO	N/A	Connected, Involved Citizens
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Smart City Challenge Finalists Project Proposals

Healthcare Clinics	Clinics			
Bike Lanes	A bicycle network will provide safe, accessible active transportation routes, and it has already been set into motion by the city. Bike Priority Lane.	✓	✓	✓
Shared Use Delivery Vehicles	Real-time Information to enable shared use of vehicles for goods delivery (e.g., identifying available drivers and vehicles, such as commuter shuttles, that can serve a combined urban delivery function while providing personal mobility trips or a dedicated delivery function during off-peak hours).		✓	
Mobility Marketplace	Moovel's multi-modal trip planning application will deliver real-time, multi-modal trip and services planning via multilingual decision support applications that assist travelers, including those with disabilities, in finding and choosing accessible transportation solutions. The application will provide turn-by-turn voice guidance for driving with real-time traffic; incidents and road closures; routing and guiding for transit; pedestrian; and rideshare information.		✓	✓
Local History (from Kiosks)	Kiosks will provide information on city services, current events, transportation services, local business information, public digital art, local history, and entertainment.			✓

Smart City Challenge Finalists Project Proposals



Smart City Challenge Finalists Project Proposals

San Francisco	CA	N/A	Connected, Involved Citizens
Columbus	OH	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Columbus	OH	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs
Kansas City	MO	Vehicle / Vehicle Collisions (non-intersections)	Connected Vehicles
Austin	TX	N/A	Strategic Business Models and Partnering Opportunities
Kansas City	MO	N/A	Strategic Business Models and Partnering Opportunities
Kansas City	MO	Understanding Citizen Needs / Issues	Connected, Involved Citizens
Columbus	OH	N/A	Strategic Business Models and Partnering Opportunities
Portland	OR	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Pittsburgh	PA	Pedestrian / Bicyclist Safety and Mobility	Smart Land Use
San Francisco	CA	Siloed Data	Architecture and Standards
Columbus	OH	Freight Delays / Congestion	Urban Delivery and Logistics
Columbus	OH	N/A	Strategic Business Models and Partnering Opportunities
Denver	CO	Interoperability, Privacy, and Security	Architecture and Standards

Smart City Challenge Finalists Project Proposals

Website	Website			
Transit Data	Transit Ridership		✓	
Parking Codes to Accommodate EVs	Modify parking codes to support EVs			✓
Emergency Electronic Brake Light Warning	Emergency Electronic Brake Light Warning	✓		
Partnership with Healthcare	Partnership Central Health			✓
Partnership with Mobileye	Partnership with Mobileye	✓		
Community Outreach / Engagement	Community Outreach / Engagement			✓
Partnership to Engage Small Businesses and DBEs	Partnership with Rev1 Venture			
Probe Data Collection	Discuss trucks as probes		✓	
Bike Lanes	Bike Lanes	✓	✓	✓
Open Data	Open Data Environment			
Truck Platooning	V2V platooning of two trucks (including tests on arterials) through partnership with Peloton; would consider platoons at signalized intersections (platoon signal priority) and leverage SPaT messages.		✓	✓
Partnership with Private Consulting Firm	Battelle, PB, CDM Smith			
Standards and Architecture	An assigned Architecture and Standards Lead at the program level who is charged with coordination of all Denver Smart City, regional,			

Smart City Challenge Finalists Project Proposals



Smart City Challenge Finalists Project Proposals

Austin	TX	Complexity of Planning / Completing a Trip	User-Focused Mobility Services and Choices
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Columbus	OH	Siloed Data	Urban Analytics
Pittsburgh	PA	N/A	Strategic Business Models and Partnering Opportunities
Portland	OR	Lack of Available Parking and/or Parking Information	User-Focused Mobility Services and Choices
Austin	TX	Lack of EV Charging Infrastructure / Range Anxiety	Smart Grid, Roadway Electrification, and EVs
Pittsburgh	PA	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Austin	TX	N/A	Smart Land Use

Smart City Challenge Finalists Project Proposals

	coordination of all Denver Smart City, regional, national and international architecture and standards development activities.				
Monthly Mobility Packages	Travelers could purchase monthly plans that would allow various combinations of mode travel choices per month, or employers could subsidize plans on their employees' behalf. Austin plans to enable RFID cards from employers and educators to access the many modes included in the subscriptions. This will also allow the city to expand the user base by thousands of users at a time as new clients are added.	✓	✓	✓	
Fusing Transportation Data with Non-Transportation Data	Includes things like calls for service, etc.	✓	✓	✓	✓
Partnership with Amazon Web Services	Partnership with Amazon Web Services				
Parking Management and Information	Will leverage Sidewalk Labs for parking data and analytics.		✓	✓	
Incentives for Off-Peak Charging	Off-Peak Charging			✓	
Performance Measure Dashboard	Performance Measure Dashboard	✓	✓	✓	✓
Smart Growth Initiatives	Will pursue a mobility bond in November 2016 to include \$40 Million in physical improvements to the Riverside Corridor, expanding bicycle facilities and intersection technologies necessary to allow the BRT to operate on the inside lanes of this		✓	✓	

Smart City Challenge Finalists Project Proposals



Smart City Challenge Finalists Project Proposals

Denver	CO	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Kansas City	MO	N/A	Strategic Business Models and Partnering Opportunities
Austin	TX	Digital Barriers	Low Cost, Efficient, Secure, and Resilient ICT
Denver	CO	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs
Portland	OR	Freight Delays / Congestion	Urban Delivery and Logistics
San Francisco	CA	Delays at Intersections	Connected Vehicles
Pittsburgh	PA	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Denver	CO	Freight Delays / Congestion	Urban Automation
Austin	TX	N/A	Strategic Business Models and Partnering Opportunities
San Francisco	CA	Lack of Travel Options	Smart Land Use
Kansas City	MO	Transit Collisions with Vehicles / Pedestrians	Connected Vehicles
Denver	CO	Lack of Interoperability of Payment Systems for Transportation Services	User-Focused Mobility Services and Choices

Smart City Challenge Finalists Project Proposals

	multi-lane arterial. Working to prioritize transit oriented development; corridors for redevelopment and affordable housing.			
Probe Data Collection	Partnership with WAZE; also collecting BSMs	✓		
Partnership with Academic	Partnership with Academic			
Free Public Wi-Fi	Expansion of Wi-Fi in underserved communities.			✓
EV Taxi Partnership	Partnership with Transdev, owner of Denver's largest taxi fleet, to deploy 10 Nissan LEAFs and 5 Tesla Model S in 2017 with the potential to scale to 65 EVs by the end of the grant period.		✓	
Freight Signal Priority	Freight Signal Priority	✓	✓	
MMITSS / I-Sig	Multimodal Traffic Signal System (MMITSS)	✓		
Sidewalk Labs Flow Platform	Sidewalk Labs to support analytics with mention improving and expanding dynamic parking.	✓		
Truck Platooning	Peloton - V2V platooning of two trucks (with freight signal priority).	✓	✓	
Partnership with Private Consulting Firm	Siemens; Cirrus Logic			
Connected Carpool Lanes	Regional connected carpool lanes and conversion of lanes to HOV use.	✓	✓	
Vehicle Turning Right in Front of Transit Vehicle	Vehicle Turning Right in Front of Transit Vehicle	✓		
Integrated Payment	Fully integrated payment platform.	✓		✓



















Smart City Challenge Finalists Project Proposals



Smart City Challenge Finalists Project Proposals

Austin	TX	Unpredictable / Unreliable Transit Service	Smart Grid, Roadway Electrification, and EVs
San Francisco	CA	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs
Kansas City	MO	Digital Barriers	Low Cost, Efficient, Secure, and Resilient ICT
Austin	TX	Lack of Travel Options	User-Focused Mobility Services and Choices
Pittsburgh	PA	Barriers to Employment/Education, and Other Services	Connected, Involved Citizens
Portland	OR	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Columbus	OH	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Portland	OR	Lack of EV Charging Infrastructure / Range Anxiety	Smart Grid, Roadway Electrification, and EVs
Austin	TX	Vehicle / Vehicle Collisions (intersections)	Connected Vehicles
Kansas City	MO	Pedestrian / Bicyclist Safety and Mobility	Smart Land Use
Kansas City	MO	Lack of Travel Options	User-Focused Mobility Services and Choices
Portland	OR	Lack of EV Charging Infrastructure / Range Anxiety	Smart Grid, Roadway Electrification, and EVs

Smart City Challenge Finalists Project Proposals

Electric BRT	Electric BRT Service			
Tax Exemptions for EV Purchase	Tax Exemptions for EV Purchase			
Wi-Fi on Buses	Free Wi-Fi on buses			
Carshare Options	Carshare Options			
Web App with Service Needs for Homeless	Web App with Service Needs for Homeless (indicate 60% of homeless have cell phones)			
Sidewalk Labs Flow Platform	Will leverage Sidewalk Labs for anonymized trip origin/destination data and analytics for various modes (transit, bike, walking); parking data and analytics.			
Developer Platform (APIs and SDKs)	Will provide APIs and SDKs			
Wireless Inductive Charging	Stationary wireless charging devices and dynamic wireless charging devices to be demonstrated as part of a commercial pilot.			
Intersection Movement Assist (IMA)	Intersection Movement Assist (IMA)			
Bike Lanes	Bike lanes developed out of road diets will enable yet more travel choices for citizens that desire to bike along specific east-west and north-south corridors.			
Bikeshare Options	Bikeshare			
EV Charging Stations	Will deploy 60 charging stations for city fleet vehicles. Portland will expand the availability of highly visible DC fast charging stations to encourage more TNCs and taxi drivers to choose			

Smart City Challenge Finalists Project Proposals



Smart City Challenge Finalists Project Proposals

Denver	CO	Understanding Citizen Needs / Issues	Connected, Involved Citizens
Kansas City	MO	Freight Delays / Congestion	Connected Vehicles
Columbus	OH	Lack of Travel Options	User-Focused Mobility Services and Choices
Austin	TX	Lack of Travel Options	User-Focused Mobility Services and Choices
San Francisco	CA	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Columbus	OH	Unpredictable / Unreliable Transit Service	User-Focused Mobility Services and Choices
Portland	OR	Lack of Travel Options	User-Focused Mobility Services and Choices
Denver	CO	Data Storage and Management	Urban Analytics
San Francisco	CA	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Portland	OR	Siloed Data	Architecture and Standards
Denver	CO	N/A	Low Cost, Efficient, Secure, and Resilient ICT
Kansas City	MO	N/A	Strategic Business Models and Partnering Opportunities
Portland	OR	Limited Tools to Support Data Driven Decision Making	Urban Analytics

Smart City Challenge Finalists Project Proposals

	encourage more TNCs and taxi drivers to choose electric.				
Community Outreach / Engagement	Community Outreach / Engagement				✓
CV Trucks	100 trucks; 100 drayage vehicles	✓	✓	✓	
Bikeshare Options	Kiosks will provide bikeshare options; and pedal assist bikes		✓	✓	✓
Bikeshare Options	Bikeshare Options		✓	✓	✓
Crash Analytics	Analytics thru Mobileye	✓			
Dynamic Transit Operations	Dynamic Transit Operations linking multi-modal transportation options with travelers through dynamic transit vehicle scheduling, dispatching, and routing capabilities.		✓	✓	
e-Bikes	Integrated electric mobility hubs with charging equipment for BIKETOWN e-bikes and EV charging.			✓	✓
AWS Cloud Hosting	AWS Cloud Hosting				
CCTV Cameras	CCTV Cameras	✓	✓		
Open Data	Open Data				
Existing Fiber	Existing Fiber Optic Network				
Partnership with DOE	Partnership with DOE			✓	
Emissions and Air Quality Analytics	Analytics to better understand the impacts from traffic emissions on public health and climate			✓	

Smart City Challenge Finalists Project Proposals



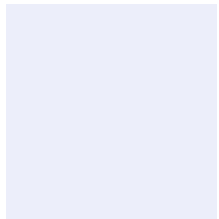
Smart City Challenge Finalists Project Proposals

Denver	CO	Digital Barriers	Low Cost, Efficient, Secure, and Resilient ICT
San Francisco	CA	Digital Barriers	Low Cost, Efficient, Secure, and Resilient ICT
Kansas City	MO	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Denver	CO	Limited Data to Monitor the Transportation System	Connected Vehicles
Pittsburgh	PA	Siloed Data	Urban Analytics
Denver	CO	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Portland	OR	Poor Air Quality / Harmful Vehicle Emissions	Smart Grid, Roadway Electrification, and EVs
Austin	TX	Transit Collissions with Vehicles / Pedestrians	Connected Vehicles
San Francisco	CA	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs
Denver	CO	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs
Pittsburgh	PA	Lack of EV Charging Infrastructure / Range Anxiety	Smart Grid, Roadway Electrification, and EVs
Denver	CO	N/A	Strategic Business Models and Partnering Opportunities

Smart City Challenge Finalists Project Proposals

	change.				
Free Public Wi-Fi	Expansion of Wi-Fi in underserved communities.				✓
Wi-Fi on Taxis	Wi-Fi hotspots on taxis				✓
Developer Platform (APIs and SDKs)	APIs				
CV Private Vehicles	1,500 private vehicles	✓	✓	✓	
Fusing Transportation Data with Non-Transportation Data	Linking with 311 Information	✓	✓	✓	✓
DSRC Equipment	V2I equipment	✓	✓	✓	
Electric Buses	TriMet will expand its fleet electrification program by purchasing additional buses and adding charging infrastructure to support electric buses.			✓	
Mobileye Technology	Mobileye technology on buses	✓			
Energy Credits	Energy Credits			✓	
EV TNC Partnership (Renting Vehicles)	Partnership with Evercar, which currently is offering EVs to TNC drivers in Los Angeles for \$5 per hour. The city's goal is to deploy 50 EVs for TNC drivers in Denver in 2017, laying the groundwork for large-scale expansion.		✓	✓	✓
EV Charging Stations	25 Level 2 charging stations on a DC microgrid powered by solar panels.			✓	
Partnership with Autodesk	Partnership with Autodesk				

Smart City Challenge Finalists Project Proposals



Smart City Challenge Finalists Project Proposals

San Francisco	CA	Lack of Available Parking and/or Parking Information	User-Focused Mobility Services and Choices
Austin	TX	Complexity of Planning / Completing a Trip	User-Focused Mobility Services and Choices
Denver	CO	Accessibility for People with Disabilities and the Elderly	User-Focused Mobility Services and Choices
Portland	OR	Understanding Citizen Needs / Issues	Connected, Involved Citizens
Kansas City	MO	Lack of Traveler Information	User-Focused Mobility Services and Choices
Austin	TX	Limited Data to Monitor the Transportation System	Connected Vehicles
Kansas City	MO	Freight Delays / Congestion	Urban Delivery and Logistics
Austin	TX	Limited Tools to Support Data Driven Decision Making	Urban Analytics

Smart City Challenge Finalists Project Proposals

Dynamic Pricing for Parking	Market-based pricing for parking (which has been piloted by the city in the past). Building upon concepts from SFPark, the feature will include employing market-based pricing of parking and real-time information of parking supply and price through the app.	✓	✓		
Multimodal Trip Planning	The Marketplace would inform travelers about travel time, cost, and GHG impact of their options.	✓	✓	✓	
Apps for People with Disabilities	ADA compliant Kiosks				✓
Community Outreach / Engagement	Will work with technology experts and community members to define needs, brainstorm potential solutions, and refine those solutions. Recognizing that community capacity building supports meaningful outreach, we will engage community-based organizations (CBOs).				✓
Transit Information	Transit Information	✓	✓	✓	
CV Private Vehicles	Possibly 100 private vehicles	✓	✓	✓	
Freight Signal Priority	Freight Signal Priority (100 trucks)	✓	✓		
Data Management and Analytics Platform	Data Rodeo focused on data archiving, data analysis and data accessibility, with an ultimate goal of creating real-time access to data. Development of tools that can enable data mining, advanced analytics, and predictive modeling capabilities.	✓	✓	✓	✓

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Columbus	OH	Lack of Available Parking and / or Parking Information for Long Haul Trucks	Urban Delivery and Logistics
Denver	CO	Payment for Transportation for the Unbanked	User-Focused Mobility Services and Choices
Columbus	OH	Accessibility for People with Disabilities	User-Focused Mobility Services and Choices
Columbus	OH	Unpredictable / Unreliable Transit Service	Connected Vehicles
Kansas City	MO	FMLM Challenges	User-Focused Mobility Services and Choices
Columbus	OH	Limited Tools to Support Data Driven Decision Making	Urban Analytics
San Francisco	CA	Lack of Interoperability of Payment Systems for Transportation Services	User-Focused Mobility Services and Choices
Kansas City	MO	Poor Air Quality / Harmful Vehicle Emissions	Smart Grid, Roadway Electrification, and EVs
Columbus	OH	Lack of Traveler Information	User-Focused Mobility Services and Choices
Austin	TX	Freight Delays / Congestion	Urban Delivery and Logistics
Portland	OR	N/A	Connected, Involved Citizens
Portland	OR	Affordability of Housing and Associated Travel Impacts	Smart Land Use

Smart City Challenge Finalists Project Proposals

Truck Parking Information (Rest Areas)	Regional Truck Parking Information and Management System to instrument rest areas with ITS equipment to determine the real-time availability of parking spaces.	✓	✓		
Payment Cards for the Unbanked	Partnership with PayNearMe so that cash-preferred customers can access the same great mobility options as credit-enabled customers.	✓			✓
Wheel Chair Accessible AV Shuttles	EAV shuttles will be wheelchair accessible	✓			✓
Transit Signal Priority	Transit Signal Priority	✓	✓		
FMLM Connections to Transit	FMLM solutions to transit	✓			✓
Transportation Planning Analytics	Demand Modeling, etc.; exploration of archived data for planning, performance reporting, and data-driven decision making	✓	✓	✓	✓
Integrated Payment	Fully integrated payment platform.	✓			✓
EV Trucks	EV fleet transition include 6 Class 8 terminal trucks from diesel to electric at the Logistics Park KC/BNSF facility.			✓	
Transit Information	Kiosks will provide transit information	✓	✓		✓
Off-Peak Delivery	Off-Peak Delivery Service	✓			
Website	Website				
Linking Transportation Data with Housing Data	Integration of transportation into the NoAppFee app which pairs apt/home seekers to help find finding affordable housing.	✓	✓		✓

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Kansas City	MO	N/A	Smart Land Use
Pittsburgh	PA	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Pittsburgh	PA	Poor Air Quality / Harmful Vehicle Emissions	Smart Land Use
Pittsburgh	PA	N/A	Strategic Business Models and Partnering Opportunities
Austin	TX	Lack of Travel Options	User-Focused Mobility Services and Choices
Denver	CO	Lack of EV Charging Infrastructure / Range Anxiety	Smart Grid, Roadway Electrification, and EVs
Columbus	OH	Pedestrian / Bicyclist Safety	Connected Vehicles
Austin	TX	N/A	Urban Delivery and Logistics
Pittsburgh	PA	Interoperability, Privacy, and Security	Low Cost, Efficient, Secure, and Resilient ICT
Kansas City	MO	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Austin	TX	Freight Delays / Congestion	Connected Vehicles
Portland	OR	Payment for Transportation for the Unbanked	User-Focused Mobility Services and Choices
Denver	CO	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Kansas City	MO	Lack of Interoperability of Payment Systems	User-Focused Mobility Services and Choices

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Vision Zero Program	Vision Zero Program	✓			
Traffic Data	Traffic sensors to support Surtrac adaptive signal control		✓		
Emissions Reduction Plan	Emissions Reduction Plan			✓	
Partnership with DOE	Partnership with DOE			✓	
Shared Vanpool Service	Shared vanpool service that would develop spontaneous vanpools with incentives for drivers (driver rides free; HOT lane tolls are waived).	✓		✓	
Incentives for EV Charging Stations	Incentives for Businesses; multi-unit housing			✓	
Pedestrian Detection and Warning	Pedestrian Detection and Warning	✓			
Package/Food Lockers	Package and grocery pickup lockers with UPS partnership.				✓
SCMS	Security Management System				
Environmental Sensors	Air quality sensors and temperature sensors. Sensors will also assist AV shuttles.			✓	
CV Trucks	100 trucks	✓	✓	✓	
Payment Alternatives for Unbanked	Providing multiple/alternative ways to pay for services to help those families who are cash dependent (including building on existing payment cards).				✓
Performance Measure Dashboard	Performance Measure Dashboard	✓	✓	✓	✓
Integrated Payment	Fully integrated payment platform; includes		✓		✓

Smart City Challenge Finalists Project Proposals



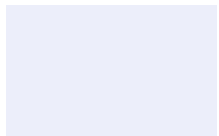
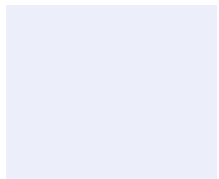
Smart City Challenge Finalists Project Proposals

		for Transportation Services	
Austin	TX	Complexity of Planning / Completing a Trip	Connected, Involved Citizens
Columbus	OH	Decarbonization of the Grid	Smart Grid, Roadway Electrification, and EVs
Columbus	OH	Freight Delays / Congestion	Connected Vehicles
Columbus	OH	Lack of Travel Options	User-Focused Mobility Services and Choices
Pittsburgh	PA	FMLM Challenges	User-Focused Mobility Services and Choices
Denver	CO	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Kansas City	MO	FMLM Challenges	User-Focused Mobility Services and Choices
Portland	OR	Freight Delays / Congestion	Urban Delivery and Logistics
San Francisco	CA	N/A	Strategic Business Models and Partnering Opportunities
Austin	TX	Complexity of Planning / Completing a Trip	User-Focused Mobility Services and Choices
Kansas City	MO	Unsafe Bus Stops	Intelligent, Sensor-based Infrastructure
Kansas City	MO	Freight Delays / Congestion	Urban Delivery and Logistics
San Francisco	CA	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs

Smart City Challenge Finalists Project Proposals

	payment for EV Charging.				
Subsidies for Travel Services	Low-income subsidy				✓
Solar Panels for EV Charging Stations	Solar Panels for EV Charging of EAV integrated with Smart Grid			✓	
CV Trucks	50 trucks	✓	✓	✓	
Carshare Options	Carshare Options		✓	✓	
FMLM Connections to Transit	FMLM Connections to Transit		✓		✓
Crash Analytics	Mobileye Analytics	✓			
AV Shuttle Hailing Application	App allows users to hail an AV Shuttle.		✓		
AV Truck Demonstration	Daimler/Freightliner to demonstrate the safety features of heavy trucks with autonomous functionality. The city will demonstrate the use of this vehicle in mixed-use corridor traffic.	✓	✓		
Partnership with Mobileye	Partnership with Mobileye	✓			
Transit Subsidies	Co-developing, with Capital Metro, a way to optimize subsidy performance with respect to selected metrics.		✓		✓
Pedestrian Detectors (bus stops)	Sensors at bus stops (density sensors)	✓			
Truck Platooning	When truck following distance regulations are finalized the region can become a test-bed for truck platooning.		✓	✓	
Converting Public Fleets to EVs	San Francisco is focused on a strong movement to EV usage and on charging stations and a			✓	

Smart City Challenge Finalists Project Proposals



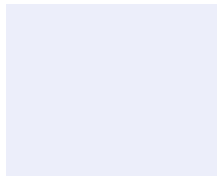
Smart City Challenge Finalists Project Proposals

Kansas City	MO	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Columbus	OH	Lack of Traveler Information	User-Focused Mobility Services and Choices
Portland	OR	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Denver	CO	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs
Kansas City	MO	Lack of EV Charging Infrastructure / Range Anxiety	Smart Grid, Roadway Electrification, and EVs
Columbus	OH	N/A	Strategic Business Models and Partnering Opportunities
Kansas City	MO	Interoperability, Privacy, and Security	Architecture and Standards
Columbus	OH	Lack of Interoperability of Payment Systems for Transportation Services	User-Focused Mobility Services and Choices
Portland	OR	Pedestrian / Bicyclist Safety	Intelligent, Sensor-based Infrastructure
San Francisco	CA	N/A	Connected Vehicles
Portland	OR	Response Times for First Responders	User-Focused Mobility Services and Choices

Smart City Challenge Finalists Project Proposals

	switch for their fleet vehicles as well as city vehicles.				
Traffic Data	Traffic/sensor data	✓			
Turn-by-Turn Directions	Turn-by-Turn Directions	✓			
TNC Data	TNC data (Uber Lyft, and Car2Go)	✓		✓	
Tax Exemptions for EV Purchase	Point of Sale Tax Credit			✓	
EV Charging Stations	New charging stations will be installed at the KCATA motor pool and along the Prospect MAX route to facilitate charging along the route.			✓	
Partnership with Vulcan	Vulcan partnership			✓	
Standards and Architecture	All aspects of the deployment will utilize existing standards for deployment and integration of new technologies.				
Integrated Payment	Fully integrated payment platform. The city will partner with Alliance Data Systems, COTA, and other regional banks to create the integrated payment system.	✓			✓
Pedestrian Detectors (intersections)	Pedestrian and bicycle detection	✓			
CV Taxis	Taxis	✓	✓	✓	
Real-Time Emergency Response Information	100 Sidewalk Labs kiosks within and near the three demonstration corridors. Kiosks will include the following: (i) free broadband internet access, (ii) high-speed phone and device charging, (iii) a	✓			✓

Smart City Challenge Finalists Project Proposals



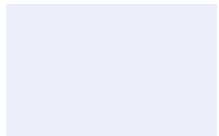
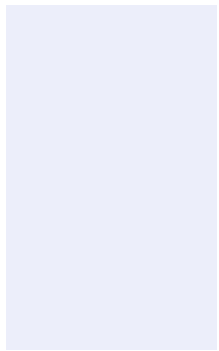
Smart City Challenge Finalists Project Proposals

San Francisco	CA	Complexity of Planning / Completing a Trip	User-Focused Mobility Services and Choices
San Francisco	CA	Complexity of Planning / Completing a Trip	User-Focused Mobility Services and Choices
San Francisco	CA	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Columbus	OH	Vehicle / Vehicle Collisions (non-intersections)	Connected Vehicles
Pittsburgh	PA	N/A	Strategic Business Models and Partnering Opportunities
Columbus	OH	Lack of Available Parking and/or Parking Information	Intelligent, Sensor-based Infrastructure
Columbus	OH	FMLM Challenges	User-Focused Mobility Services and Choices
Portland	OR	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure

Smart City Challenge Finalists Project Proposals

	tablet with information on transportation, housing, and other social services, and (iv) Real-time alerts and information on bus or train arrivals, traffic disruptions, air quality alerts, and emergency response information.			
Multimodal Trip Planning	Multimodal Trip Planning	✓	✓	✓
Mobility Marketplace	Transportation as a Service (TaaS) platform allows app users to access the platform of mobility services customized in real time to the traveler's needs and characteristics. The application provides targeted information to users that incentivizes and nudges them toward more sustainable transportation options (e.g., shared, electric) that optimize the transportation system.	✓	✓	✓
Traffic Data	Traffic/sensor data	✓		
Stopped Vehicle Ahead	Stopped Vehicle Ahead	✓		
Partnership with Vulcan	Partnership with Vulcan		✓	
Smart Parking RFID Tags	50,000 RFID tags to support smart parking applications	✓		
AV Shuttle Hailing Application	AV Shuttle Hailing Application	✓	✓	✓
Environmental Sensors	Air quality sensors / stations; and partnership with Sidewalk Labs for kiosks to include sensors that track environmental conditions.		✓	

Smart City Challenge Finalists Project Proposals



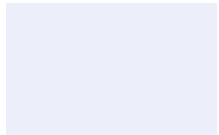
Smart City Challenge Finalists Project Proposals

San Francisco	CA	Limited Curb Space for Carpooling and Ridesourcing Vehicles	User-Focused Mobility Services and Choices
Denver	CO	Lack of Available Parking and/or Parking Information	User-Focused Mobility Services and Choices
Kansas City	MO	Lack of Available Parking and/or Parking Information	Intelligent, Sensor-based Infrastructure
Columbus	OH	Lack of Available Parking and / or Parking Information for Delivery Vehicles	Urban Delivery and Logistics
San Francisco	CA	N/A	Smart Land Use
San Francisco	CA	Interoperability, Privacy, and Security	Low Cost, Efficient, Secure, and Resilient ICT
Kansas City	MO	Overweight Trucks	Urban Delivery and Logistics
Columbus	OH	Interoperability, Privacy, and Security	Low Cost, Efficient, Secure, and Resilient ICT
Portland	OR	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs
Columbus	OH	Lack of EV Charging Infrastructure / Range Anxiety	Smart Grid, Roadway Electrification, and EVs
Kansas City	MO	Limited Data to Monitor the Transportation System	Connected Vehicles

Smart City Challenge Finalists Project Proposals

Reservations for Curb Space	Reservations of curb space for picking up and dropping off passengers using the dynamic carpool service.			
Parking Management and Information	Parking Information			
Real-Time Parking Data	Parking sensors			
Truck Parking Reservations (Urban)	Truck Smart Parking Services (TSPS) real-time parking availability service for freight delivery that includes equipping loading zones with machine vision detection and a reservation service.			
Road Diets	Road Diets			
Approach to Data Security and Privacy	Approach to Data Security and Privacy			
Weigh-in-Motion	Truck weigh stations will be upgraded to pilot a truck license plate reader and weigh-in-motion technologies.			
SCMS	Will leverage Security Credential Management System (SCMS)			
EV Bulk Buy Program	Helps put low income people into EVs			
Incentives for EV Charging Stations	Incentives for expanding availability of EV charging stations; adopt parking codes that require EV recharging facility parking facilities and street parking.			
V2I Roadside Equipment	500 roadside equipment units			

Smart City Challenge Finalists Project Proposals



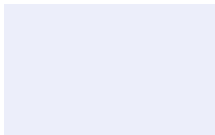
Smart City Challenge Finalists Project Proposals

Austin	TX	Siloed Data	Architecture and Standards
Portland	OR	Poor Lighting	Intelligent, Sensor-based Infrastructure
Columbus	OH	Lack of Available Parking and/or Parking Information	Intelligent, Sensor-based Infrastructure
Pittsburgh	PA	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Denver	CO	Freight Delays / Congestion	Urban Delivery and Logistics
Pittsburgh	PA	Unpredictable / Unreliable Transit Service	Connected Vehicles
Columbus	OH	Lack of Available Parking and/or Parking Information	User-Focused Mobility Services and Choices
Denver	CO	N/A	Smart Land Use
Kansas City	MO	Workforce Training / Development	Connected, Involved Citizens
San Francisco	CA	Lack of Traveler Information	User-Focused Mobility Services and Choices
Denver	CO	N/A	Strategic Business Models and Partnering Opportunities

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Open Data	Open Data Environment				
Smart Street Lights	Smart street lights				
Real-Time Parking Data	Real-time parking availability from parking operators				
Data Management and Analytics Platform	Data Utility' in collaboration with CMU and the existing WPRDC to store and share datasets and data streams with both historical and real-time API access. Partnering with CMU's Mobility Data Analytics Center to help build apps and analytics using this data and with Sidewalk Labs. The applicant will use signal data, air quality sensors and EV data to support analytics and provide data to developers.				
Truck Platooning	V2V platooning of two trucks (including tests on arterials) through partnership with Peloton.				
CV Buses	726 buses				
Parking Reservations	Users will be able to plan and book a parking space. Direct routing to parking will be supported.				
Vision Zero Program	Vision Zero Program				
Mobile Learning Lab	Mobile Lab to support training and education; equipped with computers and other equipment including Wi-Fi.				
Transit Options	Transit Options				
Partnership with Service / Equipment Vendors	Partnership with Service / Equipment Vendors				









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Pittsburgh	PA	Noise Pollution	Intelligent, Sensor-based Infrastructure
Kansas City	MO	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Kansas City	MO	N/A	Connected, Involved Citizens
San Francisco	CA	Lack of EV Charging Infrastructure / Range Anxiety	Smart Grid, Roadway Electrification, and EVs
Pittsburgh	PA	N/A	Strategic Business Models and Partnering Opportunities
Austin	TX	N/A	Strategic Business Models and Partnering Opportunities
Denver	CO	N/A	Strategic Business Models and Partnering Opportunities
Columbus	OH	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs
Portland	OR	Limited Tools to Support Data Driven Decision Making	Urban Analytics

Smart City Challenge Finalists Project Proposals

Noise Sensors	Noise monitoring sensors possible through smart street light devices, but not proposed.			
Sidewalk Labs Flow Platform	Sidewalk Labs committed to develop their Flow Transit Analytics Application by leveraging their proprietary trips and destinations from Google Maps and Waze data combined with new data that will be generated as part of the Smart City Project.			
News and Entertainment (from Kiosks)	Kiosks will provide information on city services, current events, transportation services, local business information, public digital art, local history, and entertainment.			
EV Charging Stations	EV charging stations are part of mobility hubs.			
Partnership to Engage Small Businesses and DBEs	Partnership to Engage Small Businesses and DBEs			
Partnership with Mobileye	Plan to equip buses with Mobileye technology			
Partnership with Sidewalk Labs	Sidewalk Labs Partnership			
Converting Public Fleets to EVs	Activities at the State, regional and local level to incentivize purchase of fleet and private EVs; The City of Columbus, OSU and others have made the commitment to convert vehicles; EVs will be available for government purchase by end of 2016.			
Crash Analytics	Mobileye			

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San Francisco	CA	Vehicle / Vehicle Collisions (non-intersections)	Connected Vehicles
Denver	CO	Delays on Freeways	Connected Vehicles
San Francisco	CA	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Denver	CO	N/A	Strategic Business Models and Partnering Opportunities
Austin	TX	Lack of Traveler Information	User-Focused Mobility Services and Choices
Austin	TX	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs
Kansas City	MO	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Portland	OR	Lack of Traveler Information	User-Focused Mobility Services and Choices
Kansas City	MO	Pedestrian / Bicyclist Safety	Connected Vehicles
Kansas City	MO	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
San Francisco	CA	FMLM Challenges	Urban Automation
San Francisco	CA	Lack of Traveler Information	User-Focused Mobility Services and Choices
Pittsburgh	PA	N/A	Strategic Business Models and Partnering Opportunities
Kansas City	MO	Complexity of Planning / Completing a Trip	User-Focused Mobility Services and Choices

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Blind Spot Warnings / Lane Change Warnings	Blind Spot Warnings / Lane Change Warnings	✓			
Ramp Metering	Smart Ramp Metering		✓	✓	
Performance Measure Dashboard	Performance Measure Dashboard	✓	✓	✓	✓
Smart City Forum / Institute	Smart City Forum				
Traffic Information	Traffic Information		✓		
Converting Public Fleets to EVs	Commitment to fleet electrification of municipal vehicles;			✓	
Transportation Planning Analytics	Measuring, modeling, and predicting pedestrian and multi-modal transportation flows through traffic and transit points, and open spaces.	✓	✓	✓	✓
Transit Options	Transit Options		✓	✓	✓
Pedestrian Detection and Warning	Pedestrian Detection and Warning	✓			
Transit Data	Transit Data		✓		
Low Speed Automated Vehicles	EV automated low-speed shuttle vehicles for first-mile/last-mile public transit access.	✓	✓	✓	✓
Transit Information	Transit Information		✓	✓	✓
Partnership with Autodesk	Partnership with Autodesk				
Mobility Marketplace	Trip planning application with real-time transportation and traffic information that will be accessible via smartphone or kiosk, which will make citizens well informed when deciding the		✓	✓	✓

Smart City Challenge Finalists Project Proposals



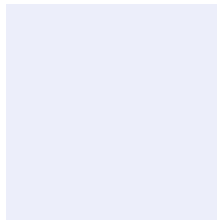
Smart City Challenge Finalists Project Proposals

Kansas City	MO	Limited Data to Monitor the Transportation System	Connected Vehicles
San Francisco	CA	Transit Collissions with Vehicles / Pedestrians	Connected Vehicles
Columbus	OH	Limited Data to Monitor the Transportation System	Connected Vehicles
Austin	TX	Unpredictable / Unreliable Transit Service	Urban Automation
Denver	CO	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Kansas City	MO	Poor Air Quality / Harmful Vehicle Emissions	Smart Grid, Roadway Electrification, and EVs
Pittsburgh	PA	N/A	Strategic Business Models and Partnering Opportunities
Columbus	OH	N/A	Connected Vehicles
Pittsburgh	PA	Complexity of Planning / Completing a Trip	User-Focused Mobility Services and Choices

Smart City Challenge Finalists Project Proposals

	best way to travel.			
CV Onboard Equipment (Total)	700 vehicles equipped with DSRC	✓	✓	✓
Mobileye Technology	Mobileye technology on buses (200)	✓		
CV Public Vehicles	400 city vehicles	✓	✓	✓
Electric L4 Automated Bus	Partnering with electric bus providers to develop and deploy a full-sized automated and connected transit bus. Will work with our partnering electric bus providers to develop and deploy a full-sized automated and connected transit bus.	✓	✓	✓
Developer Platform (APIs and SDKs)	APIs			
Electric Buses	Twelve new electric buses for KCATA MAX.			✓
Partnership with Mobileye	Partnership with Mobileye	✓		
CV School Buses	100 school buses	✓	✓	✓
Multimodal Trip Planning	MovePGH will provide residents and visitors with the ability to view comparable options across multiple modes such as public transportation, taxi, bikeshare, carshare, biking, walking, and driving and parking. Users will be able to compare travel options over categories such as real-time travel time, carbon emissions, construction detours, safety, and condition of travel paths (i.e., sidewalk		✓	✓
			✓	✓

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Columbus	OH	Pedestrian / Bicyclist Safety	Intelligent, Sensor-based Infrastructure
Columbus	OH	Transit Collissions with Vehicles / Pedestrians	Connected Vehicles
Denver	CO	N/A	Strategic Business Models and Partnering Opportunities
Denver	CO	Limited Data to Monitor the Transportation System	Connected Vehicles
San Francisco	CA	Lack of Travel Options	Smart Grid, Roadway Electrification, and EVs
Kansas City	MO	Delays at Intersections	Connected Vehicles
Portland	OR	Red Light Violations	Connected Vehicles
Portland	OR	Accessibility for People with Disabilities and the Elderly	User-Focused Mobility Services and Choices
Columbus	OH	Freight Delays / Congestion	Connected Vehicles
Columbus	OH	Interoperability, Privacy, and Security	Low Cost, Efficient, Secure, and Resilient ICT
Austin	TX	Lack of Travel Options	User-Focused Mobility Services and Choices
Portland	OR	Language Barriers	User-Focused Mobility Services and Choices
Portland	OR	Response Times for First Responders	Connected Vehicles
Denver	CO	Lack of Available Parking and / or Parking Information for Delivery Vehicles	Urban Delivery and Logistics
Denver	CO	Poor Air Quality / Harmful Vehicle Emissions	Smart Land Use
Denver	CO	N/A	Strategic Business Models and Partnering Opportunities

Smart City Challenge Finalists Project Proposals

	presence or condition).			
Pedestrian Detectors (intersections)	Pedestrian detection at signalized intersections	✓		
Vehicle Turning Right in Front of Transit Vehicle	Vehicle Turning Right in Front of Transit Vehicle	✓		
Partnership with DOE	Partnership with DOE			✓
CV Public Vehicles	1,500 municipal vehicles	✓	✓	✓
Shared Electric Connected Automated Vehicles (SECAVs)	Shared Electric Automated Vehicles (SEAVs)	✓	✓	✓
MMITSS / I-Sig	Intelligent Traffic Signal System (ISIG)		✓	
Red Light Warning Violation	Red Light Warning Violation	✓		
Apps for People with Disabilities	Accessibility Routing			
Freight Signal Priority	Freight Signal Priority		✓	✓
Approach to Data Security and Privacy	Control Access to data and resources thru AWS			
New TNC Service Providers	GetMe, Fasten, Fare, Ztrip; HailaCab, Wingz, Ride Austin		✓	
Multilingual Applications	Multilingual Applications			✓
Emergency Vehicle Preemption	Emergency Vehicle Preemption	✓		
Truck Parking and Staging Areas	Designated parking and staging areas for freight movement into the Denver area.	✓	✓	✓
Emissions Reduction Plan	Emissions Reduction Plan			✓
Partnership with Private Consulting Firm	Partnership with Private Consulting Firm			

Smart City Challenge Finalists Project Proposals



Smart City Challenge Finalists Project Proposals

Columbus	OH	N/A	Strategic Business Models and Partnering Opportunities
Pittsburgh	PA	Complexity of Planning / Completing a Trip	User-Focused Mobility Services and Choices
San Francisco	CA	Lack of Travel Options	User-Focused Mobility Services and Choices
Austin	TX	Accessibility for People with Disabilities and the Elderly	User-Focused Mobility Services and Choices
Pittsburgh	PA	Response Times for First Responders	Intelligent, Sensor-based Infrastructure
Kansas City	MO	Data Storage and Management	Urban Analytics
Austin	TX	Siloed Data	Urban Analytics
Kansas City	MO	Lack of Traveler Information	User-Focused Mobility Services and Choices

Smart City Challenge Finalists Project Proposals

Partnership with Autodesk	Autodesk Partnership				
Mobility Marketplace	MovePGH will provide residents and visitors with the ability to view comparable options across multiple modes such as public transportation, taxi, bikeshare, carshare, biking, walking, and driving and parking. Users will be able to compare travel options over categories such as real-time travel time, carbon emissions, construction detours, safety, and condition of travel paths (i.e., sidewalk presence or condition).	✓	✓	✓	
Ridesharing Options	Advancements to slugging via smart phone app (Dynamic carpool pick up curbs).	✓	✓		
Paratransit	Improve existing paratransit service	✓			✓
Gunshot Detectors	Gunshot detection possible through smart street light devices, but not proposed.	✓			
AWS Cloud Hosting	Amazon Web Services Partnership				
Fusing Transportation Data with Non-Transportation Data	Data Sharing (e.g., ITS, CV, AV, EV, healthcare, social services, etc.)	✓	✓	✓	✓
Traveler Information Kiosks	Kiosks around KCMO to increase digital connectivity in underserved neighborhoods. An additional interactive 100 kiosks around KCMO to increase digital connectivity and provide access to city services, current events, transportation services, local business information, public digital	✓	✓	✓	

Smart City Challenge Finalists Project Proposals



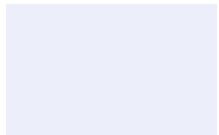
Smart City Challenge Finalists Project Proposals

Denver	CO	Lack of Traveler Information	User-Focused Mobility Services and Choices
Kansas City	MO	Siloed Data	Architecture and Standards
Austin	TX	Data Storage and Management	Urban Analytics
Pittsburgh	PA	Lack of Available Parking and/or Parking Information	Intelligent, Sensor-based Infrastructure
Portland	OR	N/A	Strategic Business Models and Partnering Opportunities
Portland	OR	Workforce Training / Development	Connected, Involved Citizens
Kansas City	MO	Unpredictable / Unreliable Transit Service	Connected Vehicles
Kansas City	MO	Accessibility for People with Disabilities and the Elderly	User-Focused Mobility Services and Choices
Pittsburgh	PA	N/A	Strategic Business Models and Partnering Opportunities
Kansas City	MO	Siloed Data	Urban Analytics
Portland	OR	Accessibility for People with Disabilities and the Elderly	User-Focused Mobility Services and Choices
Denver	CO	FMLM Challenges	Urban Automation
Kansas City	MO	Unpredictable / Unreliable Transit Service	Connected Vehicles
Columbus	OH	Lack of Traveler Information	User-Focused Mobility Services and Choices

Smart City Challenge Finalists Project Proposals

	services, local business information, public digital art, local history, and entertainment.				
Transit Options	Transit Options				
Open Data	Open Data				
AWS Cloud Hosting	AWS Partnership				
Real-Time Parking Data	Real-Time Parking Data				
Partnership with Mobileye	Partnership with Mobileye				
Mobile Learning Lab	Mobile technology lab				
Transit Signal Priority	Transit Signal Priority				
Apps for People with Disabilities	Navigation assistance app for the visually impaired (40 beacon sensors).				
Partnership with Private Consulting Firm	Partnership with Private Consulting Firm				
Fusing Transportation Data with Non-Transportation Data	Fusing Transportation Data with Non-Transportation Data				
Paratransit	Paratransit				
Low Speed Automated Vehicles	At Peña Station Next, partners Panasonic and Easymile plan to pilot an first mile / last mile low speed service using autonomous electric shuttles.				
CV Buses	25 buses				
Traveler Information Kiosks	Multi-modal Traveler Information kiosks at Neighborhood Hubs to provide access to the Mobility Marketplace system. Partnership with				

Smart City Challenge Finalists Project Proposals



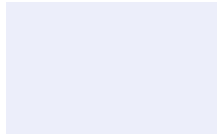
Smart City Challenge Finalists Project Proposals

Columbus	OH	Workforce Training / Development	Connected, Involved Citizens
Austin	TX	N/A	Urban Analytics
Columbus	OH	Limited Data to Monitor the Transportation System	Connected Vehicles
San Francisco	CA	Data Storage and Management	Urban Analytics
Columbus	OH	Lack of EV Charging Infrastructure / Range Anxiety	Smart Grid, Roadway Electrification, and EVs
Pittsburgh	PA	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Denver	CO	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Columbus	OH	Limited Data to Monitor the Transportation System	Connected Vehicles
Portland	OR	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Austin	TX	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs
San Francisco	CA	Vehicle / Train Collisions	Connected Vehicles

Smart City Challenge Finalists Project Proposals

	Mobility Marketplace system. Partnership with Sidewalk Labs.			
Training and Programs to Link People to Jobs	Customer Service and Logistics Career Exploration Boot Camp and Training; STEM Education (working with NXP)			✓
Regional Ops Management Center - Consolidation of Traffic Management Centers	OneSystem - integrated of traffic management systems under one roof	✓	✓	✓
CV Private Vehicles	2,100 private light vehicles	✓	✓	✓
AWS Cloud Hosting	AWS Cloud Hosting			
EV Charging Station Location and Availability Information	EV charging stations information and availability provided thru web or smartphone app. Access to the information would be made available thru an API.		✓	✓
Transit Data	Transit Data		✓	
TNC Data	TNC Data from Uber and Lyft		✓	✓
V2I Roadside Equipment	V2I equipment at 175 intersections	✓	✓	✓
Transit Data	Includes Bluetooth beacons at light rail transit, bus stops, etc.		✓	
EV Loan Program	Development of a loan program to help agencies deal with capital cost of converting to EVs.			✓
Flashing Train Coming (FTC) Warning	Flashing Train Coming (FTC) Warnings	✓		

Smart City Challenge Finalists Project Proposals



Smart City Challenge Finalists Project Proposals

Columbus	OH	N/A	Strategic Business Models and Partnering Opportunities
Denver	CO	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs
Austin	TX	Limited Data to Monitor the Transportation System	Connected Vehicles
Denver	CO	Siloed Data	Architecture and Standards
Kansas City	MO	N/A	Connected, Involved Citizens
San Francisco	CA	Pedestrian / Bicyclist Safety and Mobility	Smart Land Use
San Francisco	CA	Lack of Travel Options	Urban Automation
Columbus	OH	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Kansas City	MO	Lack of Available Parking and/or Parking Information	User-Focused Mobility Services and Choices
Portland	OR	Digital Barriers	Low Cost, Efficient, Secure, and Resilient ICT
Pittsburgh	PA	Workforce Training / Development	Connected, Involved Citizens
Kansas City	MO	Poor Air Quality / Harmful Vehicle Emissions	Connected Vehicles
Pittsburgh	PA	Lack of Travel Options	User-Focused Mobility Services and Choices

Smart City Challenge Finalists Project Proposals

Partnership with Mobileye	Mobileye Partnership	✓	✓		
EV Education and Promotional Events	EV Education and Promotional Events			✓	
CV Public Vehicles	The majority of the equipped vehicles	✓	✓	✓	
Open Data	Open Data				
Local Business Information (from Kiosks)	Kiosks will provide information on city services, current events, transportation services, local business information, public digital art, local history, and entertainment.				✓
Bike Lanes	Bike Lanes		✓	✓	
AV for Delivery and Municipal Services	AV demonstration of “delivery or municipal service.”		✓		
Traffic Data	Traffic/sensor data (INRIX and HERE); incidents; work zones		✓		
Parking Reservations	Allows drivers to reserve parking spots.		✓	✓	
Free Public Wi-Fi	Kiosks will include free broadband internet access.				✓
Training and Programs to Link People to Jobs	Training and Programs to Link People to Jobs				✓
Eco-Approach and Departure at Signalized Intersections	Operation Green Light (OGL)			✓	
Ridesharing Options	Ridesharing Options		✓	✓	

Smart City Challenge Finalists Project Proposals



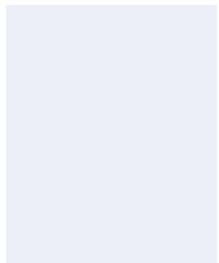
Smart City Challenge Finalists Project Proposals

Denver	CO	N/A	Urban Automation
Denver	CO	Lack of Travel Options	User-Focused Mobility Services and Choices
Pittsburgh	PA	Delays at Intersections	Connected Vehicles
Columbus	OH	N/A	Strategic Business Models and Partnering Opportunities
San Francisco	CA	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Columbus	OH	Unsafe Bus Stops	Connected Vehicles
Columbus	OH	Accessibility for People with Disabilities and the Elderly	User-Focused Mobility Services and Choices
Denver	CO	Delays at Intersections	Connected Vehicles
San Francisco	CA	Lack of Traveler Information	User-Focused Mobility Services and Choices
Austin	TX	Pedestrian / Bicyclist Safety	Connected Vehicles
Austin	TX	N/A	Strategic Business Models and Partnering Opportunities
Pittsburgh	PA	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Kansas City	MO	Lack of Traveler Information	User-Focused Mobility Services and Choices
Pittsburgh	PA	Pedestrian / Bicyclist Safety	Connected Vehicles

Smart City Challenge Finalists Project Proposals

AV Testing Facility	AV Testing Facility				
Carshare Options	Carshare Options				
Adaptive Signal System	Surtrac real-time adaptive traffic signal system with DSRC				
Partnership with Healthcare	Partnership with Healthcare				
Data Management and Analytics Platform	Data Management and Analytics Platform				
Transit Stop Pedestrian Warning	Transit Stop Pedestrian Warnings				
Apps for People with Disabilities	App&Town application allows persons with disabilities to plan and navigate transit systems to achieve personal mobility. The application includes a proprietary turn-by-turn navigator to support the elderly. Cognitively impaired, and visually impaired.				
MMITSS / I-Sig	Intelligent Traffic Signal Systems for Connected Vehicles				
Traffic Information	Traffic Information				
Pedestrian Detection and Warning	Pedestrian Detection and Warning				
Partnership with Public Agency	Various partnerships				
Crash Analytics	Crash Analytics				
Transit Options	Transit Options from Kiosks				
Pedestrian Detection and Warning	Pedestrian Detection and Warning				

Smart City Challenge Finalists Project Proposals



Smart City Challenge Finalists Project Proposals

Kansas City	MO	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Denver	CO	N/A	Strategic Business Models and Partnering Opportunities
Austin	TX	Poor Roadway / Pavement Conditions	Intelligent, Sensor-based Infrastructure
Columbus	OH	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs
Denver	CO	Lack of Available Parking and/or Parking Information	Intelligent, Sensor-based Infrastructure
Pittsburgh	PA	N/A	Strategic Business Models and Partnering Opportunities
Columbus	OH	N/A	Low Cost, Efficient, Secure, and Resilient ICT
Columbus	OH	Lack of Available Parking and/or Parking Information	User-Focused Mobility Services and Choices
Columbus	OH	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Pittsburgh	PA	Siloed Data	Architecture and Standards
Pittsburgh	PA	Lack of Available Parking and/or Parking Information	User-Focused Mobility Services and Choices

Smart City Challenge Finalists Project Proposals

Performance Measure Dashboard	Performance Measure Dashboard	✓	✓	✓	✓
Partnership with Vulcan	Vulcan partnership			✓	
Pothole and Roadway Condition Data	Leveraging Mobileye for road conditions and pavement conditions	✓			
EV Education and Promotional Events	'Ride and Drive' events allowing citizens to test EVs.			✓	
Real-Time Parking Data	Real-Time Parking Data		✓	✓	
Partnership with Service / Equipment Vendors	Partnership with Service / Equipment Vendors				
Existing Fiber	CCTN includes current project to upgrade and expand Fiber backbone				
Parking Management and Information	Event Parking Management will leverage real-time parking availability from parking operators and will leverage a partnership with HERE. Users will be able to plan and book a parking space. Direct routing to parking will be supported. RFID Parking stickers would enable the city to monitor the number of permitted vehicles in a zone and automate enforcement.		✓	✓	
Sidewalk Labs Flow Platform	Data		✓		
Open Data	Open Data				
Parking Management and Information	MovePGH will provide and parking information.		✓	✓	

Smart City Challenge Finalists Project Proposals



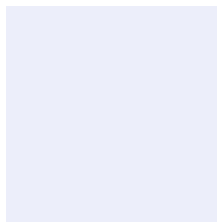
Smart City Challenge Finalists Project Proposals

Kansas City	MO	N/A	Strategic Business Models and Partnering Opportunities
Kansas City	MO	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Columbus	OH	Lack of Travel Options	User-Focused Mobility Services and Choices
Austin	TX	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Columbus	OH	Complexity of Planning / Completing a Trip	User-Focused Mobility Services and Choices
San Francisco	CA	N/A	Low Cost, Efficient, Secure, and Resilient ICT
Portland	OR	N/A	Strategic Business Models and Partnering Opportunities
Denver	CO	Lack of Traveler Information	User-Focused Mobility Services and Choices
Austin	TX	FMLM Challenges	Connected, Involved Citizens
Columbus	OH	Lack of Available Parking and / or Parking Information for Delivery Vehicles	Intelligent, Sensor-based Infrastructure

Smart City Challenge Finalists Project Proposals

Partnership with Vulcan	Partnership with Vulcan				✓
RFID Tags for Pedestrians and Bicyclists	50,000 pedestrians and bicyclists will be given RFID tags/stickers	✓			
TNCs	TNCs		✓	✓	
Hackathons	Problem-centered "Hackathons"				
Transit Subsidies	Working with employers to provide subsidies		✓	✓	✓
Mesh Network	Plan to establish a "mesh network" by equipping public transit vehicles, taxis, and other city fleet vehicles that will be equipped with Wi-Fi access points.				✓
Partnership with Vulcan	Partnership with Vulcan				✓
Traveler Information Kiosks	50 standalone Sidewalk Labs kiosks offer free Wi-Fi and transit information for users who might not have a smartphone or robust data plan. Kiosks in underserved communities, and will place 15 kiosks in areas capable of supporting higher advertising revenue.		✓	✓	✓
FMLM Connections and Shuttles to Healthcare Clinics	The six clinics serve individuals and families who are low-income, and face educational, workforce readiness, health and safety barriers to opportunity. The pilot will focus on the first-last mile and shuttle connections to these clinics		✓		✓
Sensors at Truck Loading Zones	Machine vision detection and a reservation service at loading zones.	✓	✓	✓	


















Smart City Challenge Finalists Project Proposals



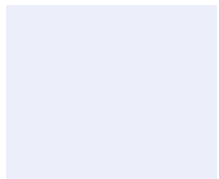
Smart City Challenge Finalists Project Proposals

Columbus	OH	Red Light Violations	Connected Vehicles
Portland	OR	Digital Barriers	Connected, Involved Citizens
Columbus	OH	Workforce Training / Development	Architecture and Standards
Portland	OR	Poor Air Quality / Harmful Vehicle Emissions	Smart Land Use
Kansas City	MO	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs
Denver	CO	Limited Data to Monitor the Transportation System	Connected Vehicles
Kansas City	MO	Lack of Traveler Information	User-Focused Mobility Services and Choices
Columbus	OH	Siloed Data	Architecture and Standards
Kansas City	MO	Noise Pollution	Intelligent, Sensor-based Infrastructure
Denver	CO	Limited Data to Monitor the Transportation System	Connected Vehicles
Kansas City	MO	N/A	Connected, Involved Citizens
San Francisco	CA	Interoperability, Privacy, and Security	Architecture and Standards
San Francisco	CA	Pedestrian / Bicyclist Safety	Intelligent, Sensor-based Infrastructure
Portland	OR	N/A	Strategic Business Models and Partnering Opportunities
Portland	OR	Limited Tools to Support Data Driven	Connected Vehicles

Smart City Challenge Finalists Project Proposals

Red Light Warning Violation	Red Light Warning Violation			
Training for Transportation Options and Technology	Technology and transportation option training.			
Mobile Learning Lab	Mobile Learning Lab			
Emissions Reduction Plan	Emissions Reduction Plan			
Converting Public Fleets to EVs	Converting Public Fleets to EVs			
V2I Roadside Equipment	100 Roadside equipment units + 200 intersections equipped (new Cobalt Sky traffic signal controller); equip arterials with 100 RSUs thru partnership with NXP			
Traffic Information	Traffic Information			
Open Data	Open Data Environment			
Noise Sensors	Noise Sensors connected to Smart Street Lights.			
CV Onboard Equipment (Total)	3,000 vehicles equipped with DSRC			
Public Safety Information (from Kiosks)	Kiosks will provide information on city services, current events, transportation services, local business information, public digital art, local history, and entertainment.			
Standards and Architecture	Standards and Architecture; CVRIA and SET-IT			
Pedestrian Detectors (intersections)	Pedestrian sensors			
Partnership with DOE	Partnership with DOE			
Vehicle Emissions Estimation	Real-Time Emissions from CVs			

Smart City Challenge Finalists Project Proposals



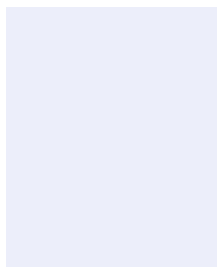
Smart City Challenge Finalists Project Proposals

Decision Making			
Denver	CO	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Kansas City	MO	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Columbus	OH	Interoperability, Privacy, and Security	Architecture and Standards
Austin	TX	Understanding Citizen Needs / Issues	Connected, Involved Citizens
Portland	OR	Unpredictable / Unreliable Transit Service	Connected Vehicles
Austin	TX	Delays at Intersections	Connected Vehicles
Austin	TX	Complexity of Planning / Completing a Trip	User-Focused Mobility Services and Choices
Denver	CO	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Austin	TX	Limited Data to Monitor the Transportation System	Connected Vehicles
Austin	TX	Lack of Travel Options	User-Focused Mobility Services and Choices
Austin	TX	Poor Air Quality / Harmful Vehicle Emissions	Smart Grid, Roadway Electrification, and EVs
Portland	OR	Lack of Traveler Information	User-Focused Mobility Services and Choices

Smart City Challenge Finalists Project Proposals

Environmental Sensors	Air Quality Sensors				
CCTV Cameras	Video sensors to detect blockages on the street car line.				
Standards and Architecture	Commitment to using existing standards, architectures, and certification processes.				
Smart Ambassadors	Smart Ambassador program to educate and recruit use of the Mobility Marketplace.				
Transit Signal Priority	Transit Signal Priority				
MMITSS / I-Sig	Multimodal Traffic Signal System (MMITSS)				
Multimodal Hubs / Stations	Smart Stations and sidewalk kiosks to improve access to affordable, timely mobility for all.				
Transit Data	Transit Data				
V2I Roadside Equipment	V2I equipment along 6 mile corridor - 16 intersections				
TNCs	Ride hailing Services				
EV Trucks	Converting delivery vehicles to EVs.				
Transit Information	100 Sidewalk Labs kiosks within and near the three demonstration corridors. Kiosks will include the following: (i) free broadband internet access, (ii) high-speed phone and device charging, (iii) a tablet with information on transportation, housing, and other social services, and (iv) Real-time alerts				

Smart City Challenge Finalists Project Proposals



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Denver	CO	N/A	Strategic Business Models and Partnering Opportunities
Austin	TX	Vehicle / Vehicle Collisions (non-intersections)	Connected Vehicles
Kansas City	MO	Digital Barriers	Low Cost, Efficient, Secure, and Resilient ICT
Pittsburgh	PA	Lack of Traveler Information	User-Focused Mobility Services and Choices
Pittsburgh	PA	N/A	Smart Land Use
San Francisco	CA	Understanding Citizen Needs / Issues	Connected, Involved Citizens
Denver	CO	Complexity of Planning / Completing a Trip	User-Focused Mobility Services and Choices
Kansas City	MO	Poor Lighting	Intelligent, Sensor-based Infrastructure
Pittsburgh	PA	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Austin	TX	Lack of Available Parking and / or Parking Information for Delivery Vehicles	Urban Delivery and Logistics
Denver	CO	N/A	Strategic Business Models and Partnering Opportunities
San Francisco	CA	Response Times for First Responders	Connected Vehicles
Austin	TX	N/A	Strategic Business Models and Partnering Opportunities
Denver	CO	Lack of Traveler Information	User-Focused Mobility Services and Choices

Smart City Challenge Finalists Project Proposals

	and information on bus or train arrivals, traffic disruptions, air quality alerts, and emergency response information.				
Partnership with non-Profit	Partnership with non-Profit				
Blind Spot Warnings / Lane Change Warnings	Blind Spot Warnings / Lane Change Warnings	✓			
Free Public Wi-Fi	Expansion of Wi-Fi, especially in underserved areas will increase citizens' connectivity, which will create more access to important information, education, and job opportunities.				✓
Transit Options	Transit Options		✓	✓	✓
Vision Zero Program	Vision Zero Program	✓			
Community Liaisons	Community Liaisons				
Multimodal Trip Planning	Multimodal Trip Planning		✓	✓	✓
Smart Street Lights	Smart street lights	✓		✓	
DSRC Equipment	DSRC Equipment	✓	✓	✓	
Truck Parking Information (Urban)	Real-time information to help find available parking in urban areas.		✓	✓	
Partnership with Academic	University of Colorado, Colorado School of Mines				
Emergency Vehicle Preemption	Emergency Vehicle Preemption	✓			
Partnership with Vulcan	Vulcan partnership				✓
Traffic Information	Traffic Information		✓		

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Kansas City MO Complexity of Planning / Completing a Trip User-Focused Mobility Services and Choices

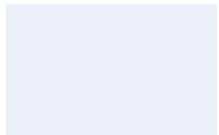
Portland OR Poor Air Quality / Harmful Vehicle Emissions User-Focused Mobility Services and Choices

San Francisco	CA	Vehicle / Vehicle Collisions (non-intersections)	User-Focused Mobility Services and Choices
Columbus	OH	Delays at Intersections	Connected Vehicles
Kansas City	MO	Vehicle / Vehicle Collisions (non-intersections)	Connected Vehicles
Denver	CO	N/A	Strategic Business Models and Partnering Opportunities
San Francisco	CA	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs
Portland	OR	Lack of Travel Options	User-Focused Mobility Services and Choices
San Francisco	CA	Limited Tools to Support Data Driven Decision Making	Urban Analytics

Smart City Challenge Finalists Project Proposals

Multimodal Trip Planning	Trip planning application with real-time transportation and traffic information that will be accessible via smartphone or kiosk, which will make citizens well informed when deciding the best way to travel.	✓	✓	✓
Air Quality Alerts	100 Sidewalk Labs kiosks within and near the three demonstration corridors. Kiosks will include the following: (i) free broadband internet access, (ii) high-speed phone and device charging, (iii) a tablet with information on transportation, housing, and other social services, and (iv) Real-time alerts and information on bus or train arrivals, traffic disruptions, air quality alerts, and emergency response information.		✓	
Safe Driving App	Safe Driving App in the Multimodal App Platform; embedded into TaaS Platform detecting speeding and hard braking	✓		
MMITSS / I-Sig	Multimodal Traffic Signal System (MMITSS)		✓	
Forward Collision Warning	Forward Collision Warning	✓		
Partnership with Public Agency	CDOT and RTD; Excel Energy			
Carbon Credits for EV Charging	Carbon Credits for EV Charging			✓
Ridesharing Options	P2P Sharing	✓	✓	✓
Congestion and Traffic Analytics	Congestion and Traffic Analytics	✓		

Smart City Challenge Finalists Project Proposals



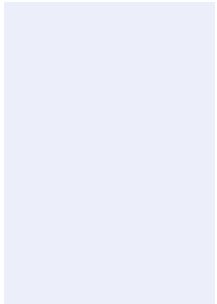
Smart City Challenge Finalists Project Proposals

Columbus	OH	Lack of EV Charging Infrastructure / Range Anxiety	Smart Grid, Roadway Electrification, and EVs
San Francisco	CA	N/A	Strategic Business Models and Partnering Opportunities
San Francisco	CA	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Portland	OR	N/A	Strategic Business Models and Partnering Opportunities
Pittsburgh	PA	FMLM Challenges	Urban Automation
Kansas City	MO	Limited Data to Monitor the Transportation System	Connected Vehicles
San Francisco	CA	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Pittsburgh	PA	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Columbus	OH	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Columbus	OH	Lack of Travel Options	User-Focused Mobility Services and Choices

Smart City Challenge Finalists Project Proposals

Wireless Inductive Charging	Wireless Inductive Charging incorporated with the Smart Grid to allow for optimal charging of EAVs leveraging photovoltaic (solar) panels.					✓
Partnership with Service / Equipment Vendors	Partnership with Service / Equipment Vendors					
TNC Data	TNC data					✓
Partnership with Private Consulting Firm	Partnership with Private Consulting Firm					
Low Speed Automated Vehicles	Electric AV shuttles (8) on three loops (traveling up to 25 mph on mostly segregated roads), to potentially be followed by a shuttle downtown on mixed streets to shuttle commuters from parking lots to the core. Potential testing up to three automated passenger cars on public roads with uncontrolled traffic conditions.	✓	✓	✓		✓
CV Public Vehicles	Public vehicles	✓	✓	✓		
Transit Data	Transit Data					✓
Transportation Planning Analytics	Transportation Planning Analytics	✓	✓	✓		✓
Congestion and Traffic Analytics	Evaluate factors affecting traffic and congestion					✓
Ridesharing Options	Dynamic Ridesharing providing automated ride matching system for carpool travelers and allowing users to offer or request rides in real-					✓

Smart City Challenge Finalists Project Proposals



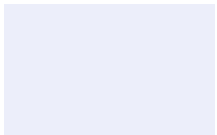
Smart City Challenge Finalists Project Proposals

Portland	OR	Lack of Travel Options	Smart Grid, Roadway Electrification, and EVs
Kansas City	MO	Freight Delays / Congestion	Urban Delivery and Logistics
San Francisco	CA	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Columbus	OH	N/A	Strategic Business Models and Partnering Opportunities
Columbus	OH	Poor Air Quality / Harmful Vehicle Emissions	Connected Vehicles
San Francisco	CA	Digital Barriers	Smart Land Use
Columbus	OH	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Denver	CO	Transit Collisions with Vehicles / Pedestrians	Connected Vehicles
Pittsburgh	PA	N/A	Strategic Business Models and Partnering Opportunities
Austin	TX	N/A	Strategic Business Models and Partnering Opportunities
Austin	TX	Digital Barriers	Low Cost, Efficient, Secure, and Resilient ICT
Austin	TX	N/A	Strategic Business Models and Partnering Opportunities
Denver	CO	Digital Barriers	Low Cost, Efficient, Secure, and Resilient ICT

Smart City Challenge Finalists Project Proposals

	time, minutes prior to departure, or make scheduled one-way appointments.			
Electric Vehicle Carshare	Electric Vehicle Carshare		✓	✓
Truck Routing / Traveler Information	Enhance KC Scout (a bi-state traffic management system) would push traffic, weather and construction information to trucks.	✓	✓	✓
Crash Analytics	Safety analytics (driver coaching based on OBDII port data).	✓		
Smart City Forum / Institute	Mid-size City Forum; will host an annual Forum with USDOT			
Eco-Approach and Departure at Signalized Intersections	Eco-Approach and Departure at Signalized Intersections			✓
Wi-Fi Parklets	Wi-Fi 'parklets' include miniature parks created from converting parking spaces along streets (with included free public Wi-Fi).			✓
Probe Data Collection	Collecting BSMs		✓	
Mobileye Technology	Mobileye technology on buses	✓		
Partnership with Public Agency	Allegheny County and others			
Partnership with OEM	GM	✓	✓	✓
Wi-Fi on Buses	Free Wi-Fi on buses			✓
Partnership with Amazon Web Services	AWS Partnership			
Wi-Fi on Buses	Free Wi-Fi on buses			✓

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Austin	TX	N/A	Strategic Business Models and Partnering Opportunities
Austin	TX	Lack of Traveler Information	User-Focused Mobility Services and Choices
Pittsburgh	PA	Unpredictable / Unreliable Transit Service	Connected Vehicles
Portland	OR	N/A	Smart Land Use
Pittsburgh	PA	Decarbonization of the Grid	Smart Grid, Roadway Electrification, and EVs
Denver	CO	Limited Tools to Support Data Driven Decision Making	Urban Analytics
San Francisco	CA	Accessibility for People with Disabilities and the Elderly	User-Focused Mobility Services and Choices
Austin	TX	Freight Delays / Congestion	Connected Vehicles
Austin	TX	Digital Barriers	Connected, Involved Citizens
Portland	OR	Education and Adoption of EVs	Smart Grid, Roadway Electrification, and EVs
Austin	TX	Poor Air Quality / Harmful Vehicle Emissions	Smart Grid, Roadway Electrification, and EVs
Austin	TX	Engaging Partners / Start-ups	Strategic Business Models and Partnering Opportunities
Kansas City	MO	Speed-related Crashes	Connected Vehicles
Portland	OR	Pedestrian / Bicyclist Safety	Connected Vehicles

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Partnership with Sidewalk Labs	Sidewalk Labs Partnership	✓		
Traveler Information Kiosks	Sidewalk Labs' Link Kiosks will be installed to address the digital divide. Twenty kiosks will be placed around the region with a focus on underserved communities.	✓	✓	✓
Transit Signal Priority	Transit Signal Priority	✓	✓	
Vision Zero Program	Vision Zero Program	✓		
Solar Parking Canopy	Solar canopy over the Second Avenue parking lot.		✓	
EV Charging Station Analytics	Integrating EV Charging Station Data into EDM; better understand charging patterns for future infrastructure		✓	
Apps for People with Disabilities	Apps for People with Disabilities			✓
Freight Signal Priority	Freight Signal Priority	✓	✓	
Instructional Videos	Tutorials on use of transit			✓
EV Taxi Partnership	Continuing transition of Portland's Fleet to EVs and expanding electrification to medium- and heavier-duty vehicles (taxis and buses).		✓	
Electric Buses	Fleet electrification of public buses.		✓	
Non-Profit Model for TNC Service	Non-profit model for TNC Service	✓		
Curve Speed Warning	Curve Speed Warning	✓		
Pedestrian Detection and Warning	Pedestrian Detection and Warning	✓		

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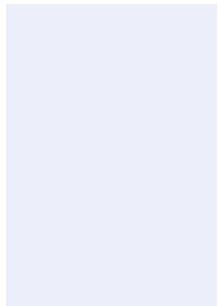
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Denver	CO	Pedestrian / Bicyclist Safety and Mobility	Smart Land Use
Pittsburgh	PA	N/A	Strategic Business Models and Partnering Opportunities
San Francisco	CA	Limited Data to Monitor the Transportation System	Connected Vehicles
Austin	TX	N/A	Connected, Involved Citizens
Austin	TX	Response Times for First Responders	Connected Vehicles
San Francisco	CA	Lack of Travel Options	User-Focused Mobility Services and Choices
San Francisco	CA	Understanding Citizen Needs / Issues	Connected, Involved Citizens
Austin	TX	FMLM Challenges	User-Focused Mobility Services and Choices
Columbus	OH	N/A	User-Focused Mobility Services and Choices

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Bike Lanes	Bike Lanes	✓	✓	✓
Partnership with NXP	Partnership with NXP	✓	✓	✓
CV Onboard Equipment (Total)	Plan to equip vehicles - no specific numbers	✓	✓	✓
Website	Website including blog and Dashboard			
Emergency Vehicle Preemption	Emergency Vehicle Preemption	✓		
After School Vanpool Shuttles	Shared van shuttle service demonstration proposal consisting of two components: (i) late night worker van shuttles between late night worker hotspots in San Francisco and dense neighborhoods in the outer parts of the City and (ii) after school van shuttles will operate similarly to a vanpool service or as a flexible microtransit system for elementary and middle school students.		✓	✓
Community Challenges for Neighborhoods	Smart City Community Challenges for Neighborhoods			
FMLM Connections to Transit	FMLM to transit; linkage of TNCs to Transit		✓	✓
Gamification / Incentivization	May utilize a gamified approach to incentivizing use of mobility apps (i.e., a \$5 incentive would be given to download the app and users would be given the opportunity to receive a FitBit. Engagement with the app would also earn user rewards from local retailers and grocers, as well as national partners.		✓	✓
















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Kansas City	MO	Vehicle / Vehicle Collisions (non-intersections)	Connected Vehicles
Denver	CO	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Kansas City	MO	N/A	Strategic Business Models and Partnering Opportunities
Columbus	OH	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
San Francisco	CA	N/A	Strategic Business Models and Partnering Opportunities
Kansas City	MO	Barriers to Employment/Education, and Other Services	Connected, Involved Citizens
Austin	TX	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Columbus	OH	Complexity of Planning / Completing a Trip	User-Focused Mobility Services and Choices
Portland	OR	Interoperability, Privacy, and Security	Low Cost, Efficient, Secure, and Resilient ICT
Austin	TX	N/A	Smart Land Use
Austin	TX	Unpredictable / Unreliable Transit Service	Connected Vehicles
Pittsburgh	PA	Lack of Traveler Information	User-Focused Mobility Services and Choices

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Queue Warning	Queue Warning				
Transportation Planning Analytics	Transportation Planning and Performance Metrics				
Partnership with Autodesk	Partnership with Autodesk				
DSRC Equipment	Plan to install V2I equipment				
Partnership with Academic	Partnership with PATH				
Job Information (from Kiosks)	Kiosks will provide information on city services, current events, transportation services, local business information, public digital art, local history, and entertainment.				
Traffic Data	Traffic/sensor data, including INRIX				
Multimodal Trip Planning	Trip Planning				
Approach to Data Security and Privacy	Approach to Data Security and Privacy				
Vision Zero Program	Vision Zero Program for Safety				
Transit Signal Priority	Transit Signal Priority				
Transit Information	MovePGH will provide residents and visitors with the ability to view comparable options across multiple modes such as public transportation, taxi, bikeshare, carshare, biking, walking, and driving and parking. Users will be able to compare travel options over categories such as real-time travel time, carbon emissions, construction detours.				

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Pittsburgh	PA	Lack of Travel Options	User-Focused Mobility Services and Choices
Portland	OR	Limited Tools to Support Data Driven Decision Making	Urban Analytics
Columbus	OH	Missed Trips to Services (i.e., Doctor Appointments)	Connected, Involved Citizens
Portland	OR	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Columbus	OH	Overheight Freight Vehicles	Urban Delivery and Logistics
Austin	TX	N/A	Strategic Business Models and Partnering Opportunities
Portland	OR	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure
Portland	OR	Limited Data to Monitor the Transportation System	Intelligent, Sensor-based Infrastructure

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	time, carbon emissions, construction detours, safety, and condition of travel paths (i.e., sidewalk presence or condition).			
TNCs	Partnership with Uber and other TNCs	✓	✓	
Hackathons	Hackathons with emphasis for people with disabilities.			
Notifications of Missed Trips to Private Service Providers	Sidewalk Labs Flow Platform to allow private service providers, such as doctor's offices, to assist their patients in planning and paying for travel to their offices as well as notification if publically assisted transportation trips are missed.			✓
Crowdsourced Pedestrian Data	Strava (fitness app) data - potential	✓		
Low Clearance Warnings for Trucks	Routing around Low Bridges	✓		
Partnership with Microtransit	Bridj; SuperShuttle	✓		✓
Traffic Data	Traffic/sensor data (Waze)	✓		
DSRC Equipment	DSRC Equipment	✓	✓	✓

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